The Builder.

Vol. XIV.—No. 704.

FROM its cathedral, its castle, and its old houses, Rochester has long been an inviting place to the antiquary; and it has become otherwise interesting from some associations. Here, the learned members of the Pickwick Club first halted; and here an inscription still announces that "six poor travellers," "not being rogues or proctors, may receive gratis, for one night, lodging, entertainment, and fourpence each." Strood, opposite Rochester, on the near side of the Medway, has itself a few interesting remnants of domestic architecture. The old bridge, shortly to be removed, would just now claim a record—though most of the antiquities of Rochester have been spoken of, and illustrated from time to time in our pages. But the new bridge now completed, and the bridge for the East Kent Railway, in progress, which adjoins the other, present special features of interest—being truly worthy illustrations of the characteristics of the works of the present day, in the amount of scientific calculation and engineering design which enters into their projection and construction.

As will be observed by the plan,* the new "town-bridge" is in continuation of the line of the main street, whether on the Rochester or the Strood side of the river; whilst the old bridge carried the road by a very circuitous course. It is therefore curious that the site last referred to should at the time of the building of the bridge, have been considered "a better place" than the line of a still older bridge, which was, in fact, the same as that of the bridge just completed. Of the older bridge remains have been met with. The Strood pier there, indeed, is on the site of one of the piers of that old bridge; and in carrying out the works, as described in a paper by Mr. John Hughes, read before the Institution of Civil Engineers in 1851, a mass of Kentish rag-stone, of the nature of rubble, without mortar, was found for a depth varying from 13 feet to 25 feet below the present bed of the river. "Pieces of timber of considerable dimensions, and having been used as piles, or framing, occurred in this bed of rubble stone, penetrating a foot or two into the gravel, which proved to be 6 or 8 feet thick." On reaching the chalk, all traces of the kind were lost. The timber was oak, elm, and beech. All the timber was sound and tough except the beech, which last was "saturated with water, and had the condition of a soft pulp." It may be well to remark, that in the foundations of the London Custom-house, which failed from causes which have been adverted to in these pages, beech piles, used green with the bark on, are said to have been chosen advisedly, on the special ground of the durability of beech under water. In the remains of the Rochester bridge, fragments of iron showed that the piles had been shod with that material. A few of the pieces of timber "had evidently been burnt." These discoveries correspond with what is recorded of the old structure. The date of that bridge is unknown; but about 1115 a code of regulations for its maintenance and repair was recorded by the bishop; and from these it seems that the bridge was of wood, on stone piers. There were ten openings, and nine piers 43 feet apart from centre of pier to centre of pier, the roadway over each opening being supported by three "sullivas," or "beams" of large dimensions, that they might "well support the planks and the great weight of all those things that pass over them." But the openings on either side of the sixth pier were provided with each, two such beams only. Thick planks were laid on the beams, and there was a low "balustrade,"—the roadway being supposed to have been about 10 feet wide. A wooden tower, called a *fortification*, built with "marvellous skill," stood near the east end, or on the Rochester side. In 1264, in the Barons' wars, when Rochester Castle held out for Henry III. the upper works of the bridge were burnt by Simon de Montfort, Earl of Leicester. In 1281, it is recorded that some of the stone piers were carried away by ice, after which the structure was ruinous till 1344-5, when the passage was made safe, and a drawbridge and barbican were added on the Strood side; but hereupon the traffic became so great, that in 1347, the bridge was again deemed unsafe. Still forty years passed ere the now existing old bridge was commenced. Even of this work, indeed, little appears in our view. Such remains of the ribbed Gothic arches as there are, however, are interesting,—examples in old pontine architecture in this country being few in number. There is a Gothic bridge at Eltham, in Kent; but much smaller, and later in date. The original stone bridge at Rochester was erected by Sir Robert Knolles and Sir John de Cobham, in great part from the proceeds of the spoils of "towns, churches, monasteries, and cities," in France, obtained during the wars of the preceding reign; and it is in the statute enacted for the repairs of bridges, dating in 1392, that the "better place" of what was then the new bridge is referred to.*

Rochester-bridge had required to be patched and propped from a period commencing many years back: the foundations of the piers, put in on the old principle, were of course, liable to be undermined; and it will be seen by the plan, that the starlings greatly obstructed the waterway. A view taken in the year 1820, now before us, represents somewhat more of the old character than the view we give. But the centre opening is there formed of timber; many of the openings appear to be faced with semicircular arches, and the balustrade is as it now exists.—Just lately the stream has been widened, as shown on the plan,—the improvements imposing the provision of a navigation way to the above-bridge part of the Medway. This requirement has obliged the adoption of a swing bridge at the Strood end of the new structure; and a similar contrivance, of course, is also provided in the railway bridge. This latter bridge, closely joining the town bridge, from which it wholly differs in character,—appearing above it in one view, and hiding it on the other side,—whatever its merits otherwise, is certainly most unfortunately designed for the effect of its neighbour; and in the view and elevation of the town bridge we have ventured to omit it. A temporary bridge now joins on to the old bridge, and a new retaining wall to the Strood bank has been constructed, protected by piles. Since these works were executed, the old bridge is said to have given fresh signs of weakness.

The management of the affairs of the bridge rests with two "wardens" and twelve "assistants," annually elected, according to an Act of Parliament of the time of Elizabeth, passed subsequent to a commission of inquiry. The estates are reported to produce a considerable rental. Part of the property bounds the Rochester bank; and here it is just now proposed to form a broad esplanade, extending for some distance, and having a retaining wall, surmounted by the old balusters of the bridge. It is also proposed to widen the entrance to the High-street, at the end of the new bridge. The record-room or bridge chamber stands near to the end of the bridge, on the Rochester side, and beneath it is the site of a porch of a chapel, or chantry, founded by John de Cobham, at the time of the building of the bridge. The chapel, "formerly called Allesolven, or All Souls, was intended chiefly for the use of travellers; and three chaplains were appointed to officiate in it, at a salary of 6*l.* each, yearly, payable out of the income of the bridge estates."*

The new town bridge and the railway bridge each consists of three openings, besides the swing bridge, which there is to each. It is in the swing bridges and the method adopted in the foundations that the chief interest and merit of these works is to be observed. In that part of the town bridge which opens, the most elaborate system of contrivances is resorted to, to relieve the work from all strain in its ordinary position fixed for land traffic, and to attain the utmost durability in the working parts. Each of the swing bridges is formed of wrought-iron rivetted girders, strutted,—the centre, or pivot of the swing, in the case of the town bridge, being on the pier, so that the swing turns in direction up the stream,—whilst the centre in the case of the railway bridge is on the abutment, so that the swing turns down the stream. In the town bridge the moveable portion has six of the rivetted plate girders in the direction of the length,—the outside girders of the six being 7 feet 11½ inches deep, at one end, and 6 feet 0¼ inch at the other end,—the four intermediate girders being somewhat less. For the strutting, the girders are intersected by boiler plate—a row of plate passing by each side the centre pivot, for extra strength thereat—and elsewhere by cast-iron pipe-strutting, which gives the requisite strength with lightness. The footpath of this part of the bridge projects on cantilevers. The bearing-points are the pivot, formed with properly prepared iron and brass, and thirty wheels, or rollers, running on a circle, or roller path, 30 feet in diameter, which is accurately planed to a slight and even inclination,—the rollers being themselves fixed on the edge of what may be called a large horizontal wheel, which keeps them in their places. The motion is given to the bridge by an endless chain, stretched round the circle over the roller path, and also round a small toothed wheel,—which last is turned by two men, standing upon and carried with the bridge. The weight to be moved is over 300 tons. By a most ingenious contrivance, when the bridge is not open for river traffic, the weight can be taken off the central pivot.—At the outer end of the radius, there is, of course, a stop, to prevent forcing the bridge too far laterally in re-closing it,—and at the same end there are a number of "setting-up screws," to which motion is given by a windlass, for the purpose of taking off the weight which would otherwise exert great leverage upon the machinery; and there is here an horizontal stop, to prevent these screws from themselves forcing up the bridge too far. At the shorter end of the moving girders a considerable weight of stone is filled in the hollow parts under the level of the causeway, so as to get the proper counterbalance. Great nicety is of course required in the planning and arrangement of these swing bridges. Plans differing from that now adopted at Rochester have been tried,—and we believe here there was at one time a proposal

* See p. 422.

* See Mr. Hughes's paper, and "History and Antiquities of Rochester," compiled chiefly by the Rev. Samuel Denne, from Thorpe's "Registrum Roffense," Lambard, Stowe, and others. Published 1772,—re-edited by Wildash, 1817.

* Address by the late Ralph Bernal, Esq. at the opening meeting of the proceedings of the British Archæological Association, at Rochester, *vide Builder*, vol. XI. 1851. In the same volume will be found other particulars of the antiquities of Rochester and the neighbourhood. At one of the meetings of the association, a long paper on the bridge by Mr. G. H. Adams, was read.

for having a reservoir of water in which a floating caisson should revolve. The contrivance now adopted seems to us to reflect great credit upon all concerned in scheming its working parts, and in carrying it out. In the railway-bridge a similar principle appears to be contemplated.

In the main portion of each bridge,—that is to say, town bridge and railway bridge—it has been shown that there are three openings and two piers. The railway bridge consists merely of wrought-iron rivetted girders, three in the width of the bridge, and continuous for the whole length of the piers and openings together. The centre girder is the deepest; and the three girders are fixed to one pier, whilst their other supports are by rollers, to allow of expansion and contraction. The timbers of the roadway are suspended from the bottom flange by two screw-bolts at each end,—this plan of course being adopted to ensure regular bearing, instead of the other alternative of straining one-half of the flange and outer girders. But it should be observed that the great dependence which in this now usual system is placed on the bolt-holes and heads of the bolts, would lead to the inference that further consideration of the subject might be desirable. This bridge is to carry the continuation of the North Kent line on to Canterbury; and great works are in progress in several parts, as about Chatham. Mr. Joseph Cubitt is the engineer of the railway bridge; Mr. Wm. Mills is the resident engineer; and Messrs. Fox and Henderson are the contractors.

The town bridge, of which, in addition to the general view, the centre and one of the side openings are shown geometrically, has three segmental arches of cast iron, and stone piers and abutments. The method adopted in the foundations here, and in the railway bridge, has excited so much attention, and involves so much ingenuity; and the question of foundations, both with reference to the method at Westminster-bridge, and generally, is now so interesting, that we propose shortly to return to the question,—to which time we defer a detailed description of the principle which appears to have been successfully carried out at Rochester. Let us remark, that the stone piers extend only down to the level of low water,—the pier, if it may be so called, below, being formed of a cluster of cylinder piles, filled with concrete,—there being fourteen piles to each pier, viz. six on each side and one to each of the cutwaters. These piles it was originally intended to sink on Dr. Potts's principle, or by exhausting the air, and allowing the pile to descend by its own weight. It was however found, in commencing at the Strood side, that the cylinder would not penetrate the bottom, and therefore a new contrivance, a modification of the diving-bell, was adopted for each cylinder, the air being compressed by an engine, so as to keep out the water, the pile descending by a weight placed at the top, and the men and materials passing in and out through valved chambers, according to an ingenious contrivance by Mr. Hughes, for which he obtained a patent. As in the instance of most valuable inventions, the priority of claim was disputed; and Mr. Bush, who commenced the sinking of a caisson, or cylinder, some time back on the Godwin Sands, has only just terminated his case,—which has been decided against him, in the House of Lords, mainly, as it would seem, because the real priority of claim would have been on the score of an invention by Lord Dundonald.

The strata at Rochester consisted of Kentish ragstone, gravel, soft chalk, and, lastly, in order of descent, hard chalk; and the cylinders were sunk in 9 feet lengths,—having to descend in some instances a total of 40 feet. The details of the work manifested great ingenuity.

Bed-plates were fixed on the top of the cylinders, and on these plates the masonry was laid. A portion of the pier corresponding with two courses of masonry, was formed by an iron curtain enclosing the piles, round the whole pier. After the foundations were completed, the works stood for some time before the superstructure was commenced. The total length of roadway, inclusive of the swing-bridge and abutments, is about 700 feet; but with the two approaches, and the land arches at the Strood end, the length would be somewhat greater. The girder framing of the swing-bridge measures about 99 feet along its sides, and 109 feet taking in the segments at each end. The length of the main portion of the bridge, or space of the three openings, is 482 feet, made up by the centre arch spanning 170 feet, two side arches, 140 feet each; and two piers, 16 feet each: and if the pier of the Rochester abutment, 40 feet, and the upper part of the pier only, next the swing-bridge, 34 feet, be added, we have a length of 556 feet for that part of the bridge. On the plan, the breadth between the parapets is 40 feet. The rise of the centre arch is 17 feet, and that of the side arches, 14 feet, or in each case, one-tenth.

There are six castings to the sweep of the centre arch and five to that of the side arches, and these castings are nutted and screwed together by flanges, the butting ends being carefully planed to get even bearing. On the plan there are eight of these arches in the breadth of the bridge, strutted by diagonal bracing-frames. The outside arches of the eight, in the 170 feet span, have the I form of section, 4 feet 6 inches in depth, with top and bottom flanges 14 inches by $2\frac{1}{2}$ inches, and a "web" of 2-inch metal. The inside arches are somewhat less in scantling. The decorative castings are screwed on, and, with the cornice and spandrils all in metal, and the iron parapet railing, are well designed for effect. At the upper angle of each spandril one inch is left for the expansion of the arch, which operates at that point, moving in direction towards the pier, in which a sinking is left to allow of such expansion. The arches spring from iron skewbacks, which pass through the pier,—that is, each arch where the piers occur butts against its neighbour.

The roadway and footpaths are carried by cast-iron plates fitted to the tops of the spandril castings. The roadway of the swing-bridge is of timber, where lightness is required.

The original contract provided for 2,500 tons of cast-iron, 35 tons of wrought-iron, 2,000 cube yards of brickwork in Portland cement, 850 cube yards of Portland cement concrete, 23,000 cubic feet of Bramley Fall stone in Portland cement, 9,000 superficial feet of 6-inch granite landings for foot paving, each stone 8 feet in length; 5,000 superficial feet of 6-inch York landings 4 feet in length, and 1,500 superficial yards of Scotch granite paving for the carriage-way, in regular courses 3 inches wide and 5 inches deep.

On the 10th June last, the three arches were all freed from their supporting centres,—when the drop of the crown of the middle arch did not exceed, even if it amounted to, one-eighth of an inch, and that of the side arches did not exceed one-sixteenth of an inch,—showing the excellence of the joinings of the ribs, and the soundness of the bedding on the skewbacks. Sir Wm. Cubitt is the engineer, and Mr. John Wright, the resident engineer. The foundations were put in by Messrs. Fox and Henderson, and the superstructure was contracted for by Messrs. Cochrane and Co.—Messrs. Lucas being sub-contractors for the masonry and brickwork.

At the landing-place on the Rochester side of the river, Mr. Wright is putting up what appears to be a well-contrived landing-stage. It is simply a hollow caisson, formed of rivetted plate-iron, and rises and falls in the direction of an inclined plane with the rise and fall of the tide,—being guided by wheels which run in chases in the masonry. Thus, descending a few steps, persons embarking can step immediately to a boat from a flat surface at all states of the tide. Some efficient contrivance has been long wanting at most of the landing-places on the Thames.

Of other improvements in Rochester, sanitary and otherwise, the necessity of which has been often remarked on in our pages, there is still much need. St. Nicholas's Cemetery, on the Maidstone-road, was opened not long ago, and comprises about three acres. Its formation and the chapels cost about 2,000*l.* but it does not appear to us that much taste has been exhibited in it.

THE ARCHÆOLOGICAL INSTITUTE.—The Congress has been held in Edinburgh: we shall give some particulars next week.

ON ORNAMENTAL LEAD-WORK.*

FLECHES.

THE wooden flêche, or steeple, was one of the chief features of every cathedral in France, where we so seldom meet with the centre tower: Chartres formerly had two flêches, one in the usual place at the intersection of the transepts and the other between this last and the angel on the chevet. Its destination was to contain a bell, which was rung from inside, to warn the ringers in the great towers when to sound the great bells. There are still two beautiful flêches remaining at Rheims and Evereux:† the latter is pierced nearly all the way to the top. In fact, so solidly were these charming little edifices constructed, and so scientific was the application of the timber and the lead, that very few indeed have perished from the effects of time, compared with those destroyed by some disastrous fire; and yet in spite of this, it is proposed to put a roof and flêche of iron and zinc upon the restored cathedral of Cologne.

DORMERS, ETC.

The only thing now wanted to complete our roof, will be the dormers and air apertures. As to the former, it is simply an affair of covering the work of the carpenter with lead, with the addition of the cresting and girouette. They deserve notice, however, as it is on their recessed pediments, and on their sides, so well protected by the eaves, that the plumber applied his polychromy.

Of air apertures, there is a charming example at Beaune (fig. 10, p. 411, *ante*). It is in two pieces, the front one is cut out, beaten up, and soldered to that at the back, the flanges of which are inserted below the slates. It may best be described as a miniature dormer, entirely formed of lead, no wood being wanted to keep it in shape, as it is so very small.

At Lincoln, the lead of the gutter ‡ (which is relatively high up) is continued outside, over the stone parapet, where it is beaten up into an 8-foil ornament. I have been able to learn no particulars concerning this beyond the fact that part of it has lately been destroyed.

Water-pipes were a comparatively late invention, and can hardly be said to have been used in the Middle Ages: when, however, they did come into use, they were made ornamental, with colour and gilding.

POLYCHROMY.

The architect having thus finished his roof, which we may observe was an affair calculated to last for four or five centuries—not simply ninety-nine years more or less,—thought that as so much pains and expense had been taken to make it strong and beautiful, it was worth while to go a little farther, and give it all the advantages of colour. How was this to be carried out? Direct polychromy could only be used in the more protected parts; and oil gilding, although in some situations very effective, hardly contrasts sufficiently with the lead to make it desirable to employ it in large quantities, to say nothing of the excessive expense.

The problem was solved by the use of tin, whose imperishable brilliancy contrasted well with the dulness of the oxidized lead, and which being applied by fire, became part and parcel of the latter metal, and could neither be washed off by the rain, like the gilding, nor cracked by the sun like the oil painting.

The process of tinning is thus performed:—The lead being first of all covered with a tolerably thick coating of lamp-black and size, and the pattern traced with a point, all that part of the surface to be tinned is removed with a shave-hook, so as to leave it quite clean and bright: a little sweet oil is then rubbed over, and the solder applied and carefully spread with a copper bit in the usual manner. The process being thus effected, the next thing, of course, was to fix the lead in the position it was designed to occupy, for this tinning was done in the workshop, although occasionally it was performed when the lead had been up many years. Thus the spire of Notre Dame de Chalon, Chalon-sur-Marne (fig. 11) was probably constructed

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* See p. 409, *ante*.

† The flêche at Evereux was repaired some few years back.

‡ In the Middle Ages, the gutters of a large church were generally so well constructed that it was unnecessary to line them with lead.

in the fourteenth century, but we must refer the tinning to at least a century later. In this case the process was the same, only much more tedious, as the workman was only able to apply so much tin as the end of his axe-bit would take up, and accordingly we find the work in the instance under consideration very coarse and rough, contrasting strongly with that on the dormer window at the east end of the same church (fig. 12).

All the lead-work of the roof was more or less susceptible of this decoration, but it was generally confined to the more ornate parts, such as the bases of the girouettes and dormer windows, but more especially to the ridge-pieces, which latter contrasted well with the long dark body of the roof, which was almost always left plain.* Almost all the principal mediæval edifices of France present more or less traces of this decoration, but I am not aware that any traces of it are to be found in England, although M. Durand who executed the lead-work for the Sainte Chapelle informed me that he had heard of some existing in England; he thought at Shrewsbury.

The places where gilding was applied are generally betrayed by the yellow or reddish colour mixed up with the oil formerly serving to attach the gold leaf,—now washed off by the weather in almost every instance,—however, the gilding has, in its turn, preserved the mordant, and we are thus enabled to detect its position. The large figures terminating the crests were formerly gilt, and, occasionally, the ridges. To such an extent was this practice carried on in the fifteenth century, that Charles IX. issued an edict, forbidding the inhabitants of towns to employ gilding on the exterior of their habitations.

It has been before observed, that the recessed pediments of the dormers, their sides (when protected by eaves), and other sheltered situations, received polychromatic decoration. The colours were not applied directly upon the lead, but upon a tinned surface, the lines alone being left to oxidize: the oil colours used upon the tinning were transparent, so that they might receive the full benefit of the brilliancy from underneath: these paintings were easy to restore, for their outline was unalterable. I should imagine the subject upon the cheeks of the dormer at Chalon-sur-Marne (fig. 12) to have been originally coloured, although only the tinning, and a few traces of the mordant of the gilding, remain. This supposition is rendered more likely from the relation of M. Barbar, an old inhabitant of the town, who told me that when a boy, at the beginning of this century, he lived close to the church, and that one night a piece of lead fell down from the roof into the yard, the which piece was enriched with a variety of positive colours, such as red, green, &c. The plumber to the hospital at Beaune also informs me, that traces of colour were found on the girouettes when under the process of restoration. According to his account the colour was thus distributed: the bases were painted in chevrons, in red (and tin); the stems had a ribband-pattern, the rondels were blue, and the ornaments gilt. At present the only perfect specimen of Polychromatic decoration upon lead I can refer to, is on the inside of the second stage of the Amiens spire.

WINDOW LEADS.

After covering the edifice, the next important employment of lead in ecclesiastical art will be found in the windows. Now, the old lead for this purpose was cast, not milled: it was also much narrower than the modern,† but contained, if anything, more metal: the consequences are, that much of it is good up to the present time, while our flat broad-milled window lead, having its grain broken by the milling, and presenting a very thin and very broad surface to the air, becomes rapidly deteriorated. At Beauvais I saw some lead, which was probably put up at the end of the last century quite in a state of oxidation; and at Tournay, where the whole of the immense windows of the choir have been filled with stained glass, a very large expense will have to be undergone, at no very distant period, to fresh lead them, as nothing better than the common cottage window lead has been employed. Theophilus, in his excellent Treatise (book ii. ch. 24, 25, 26) on the Arts of his Time, gives us a rather long description how these glazing leads were cast, two sorts of moulds being employed indifferently, viz. those in wood, or those in iron, of which the latter were, of course, preferred, on account of their superior durability: the lead was cast in pieces about a yard (ulna) long, and when wanted to be soldered together, the two pieces were anointed with wax, lead was rasped over the surface, and the tin applied with the soldering iron.

For the purposes of ventilation in domestic work it was customary to cast perforated leaden quarries. A specimen of these may be seen at the Architectural Museum, and another of a tracery pattern will be found engraved in the current number of the *Archæological Journal*.

FONTS.

Mr. Albert Way, in vol. vi. of the same publication, has enumerated no less than twenty-two leaden fonts as remaining in England: they are almost all referable to the Norman period, and present the same general features in the design, which consists for the most part of figures sealed within circular-headed arcades, with a band of foliage at the top and bottom of the composition: sometimes the figures are all the same, sometimes they alternate with scrolls, and sometimes a totally different arrangement was followed, as at Brookland, Kent, where there are two ranges of arcades, the lower containing the labours of the months, and the upper the signs of the zodiac.* At Llancaut and Tidenham, Derbyshire, are fonts both cast in the same mould. I suspect that in these fonts separate wood moulds of the arcades and figures were impressed on the sand,† and the whole cast flat, and subsequently bent into shape and soldered together. The finest lead font remaining is to be found at the cathedral of Mayence: it is of immense size, suitable for immersion: the date is the fourteenth century, and the ornaments consist of edge tracery and figures in relief.

In the museum at Amiens is a font which deserves particular notice, from the remarkable manner in which it is fabricated. All the ornaments, such as the tracery, the buttresses, the arch mould, label, and the figures can be detached by removing certain rivets: it in fact is treated exactly as if it were made of iron, not of lead.

COFFINS.

As our life begins with the font, so it ends with the coffin; and here we see the artists of the Middle Ages lavishing their pains and labour on an object which certainly stood the smallest possible chance of ever again being beheld. The ornaments on the coffins of the noblemen buried in the Temple Church are quite worthy of the golden period of art in which they were produced: they appear to me to have been executed much in the same manner as the ordinary lead fonts,‡ viz. by impressions of wooden moulds upon the sand, the sides, top, and bottom being cast separately, and then soldered. Some of the ornaments were formed by imprinting ropes in the sand, and the cist found at Lewes, containing the remains of Gundreda, the wife of Earl de Warren, was decorated with a lozenge pattern, cast from impressions of ropes.

Lead was also occasionally employed in filling up the incised lines of monumental slabs: there are several examples of this at Chalon-sur-Marne.§ But I must confess I do not see any advantage it affords over the dark cement generally used for the same object, for it is apt to oxidize, and if not continually swept gets indurated with dust, and ends in becoming almost the same colour as the stone itself.

Lead or pewter is also occasionally used instead of white enamel "argent" in armorial bearings, found on monumental brasses.

The joints of tracery, and other parts of the masonry where it was thought undesirable to wait for the setting of the mortar, are often found run with lead. This system obtains a good deal in France at the present day: for instance, the whole of the restored tracery in the triforium of Troyes Cathedral is set in lead. In some cases it cannot be said to be without its disadvantages, for in the chapter-house at Salisbury a very great many of the neckings of the columns of the arcades were found to be split off at the point where the hole had been drilled for the lead to run into.

Lead is occasionally found doing duty for carving in wood and stone, even during the Middle Ages. The practice is, I think, by no means to be recommended, and the less said about it the better.

LEAD FOR DOMESTIC USES.

There now remain a few words to be said upon lead and its alloys, as employed in the domestic life of the Middle Ages. When Etienne Borleau, in 1260, compiled his book of the trades of Paris, the workers in pewter were found sufficiently numerous to be divided into two companies, one called the "Potiers d'Estain," and the other the "Ouvriers de toutes menues Ouevres:" the former produced the pewter vessels so universally in use in the households of high and low, while the latter fabricated the mirrors, the pilgrims' tokens, the little bells for horse furniture, the charming little boxes* made of wood, and covered with perforated cast lead, the studs and ornaments for girdles, purses, &c.: in short, he was the jeweller of the poor.

In the latter part of the Middle Ages, the *potier d'étain*, or pewterer, became quite an artist, for the works of François Briot are sought after by collectors of the present day, with as much eagerness as those of Luca della Robbia: the latter in order to multiply his works, from a sculptor became a worker in clay; and the former, for similar reasons, quitted the profession of a goldsmith for that of a pewterer.

It is generally supposed that Briot's pewters are but proofs of his works in the precious metals, and that he never abandoned his former profession. In support of this, we are told that it was the custom of the goldsmiths to run proofs of their works in pewter, and that Cellini recommends the practice, and did the same thing. As regards the first argument, it is singular that we should have so many proofs (very often duplicates), of the works of Briot,† and none of his contemporaries; and as to Cellini, a reference to his work, "Trattati sopra l'orificiria," ch. xiii. will show that he only recommended sundry small ornaments (intended to be joined to repoussé work), to be modelled first in wax, then cast in lead, and finally cast in silver, for says he, "You can reduce the lead thinner than you can wax, and it will serve for another occasion." From the context it would appear that the articles cast were very small, and that the last intention of Cellini was to use them as an article of commerce.

We may, therefore, suppose that Briot, who was a contemporary of Cellini, was simply a "*potier d'étain*," but that he took the higher branch of it, viz. the manufacture of those pewter vessels which we find catalogued in the inventories as "*a façon d'argent*."

Few or none of the larger pewter vessels of the thirteenth, fourteenth, and fifteenth centuries have come down to us, beyond the half-decayed chalices and patens occasionally found in the tombs of ecclesiastics. The book of Etienne Boileau is quite sufficient to show that large quantities of them were manufactured: besides, we have the testimony of Theophilus, who gives a description as to how the ampullæ of tin were made (book iii. chaps. 87, 88, 89). No doubt the fusible quality of the material has been the cause of the deficiency; yet we can scarcely regret its being melted into such works as Briot and his contemporaries have left us.

There were two articles manufactured by the

* Specimens of patterns tinned upon lead are deposited at the Architectural Museum, Canon-row, where they can be seen. They are executed by Mr. Potter, of South Molton-street.

† Mr. Winston, in his excellent work on Stained Glass, gives sections of ancient and modern window lead, side by side.

* There are casts of these in the Museum of the Archæological Institute.

† It is quite possible that they might have been moulded in wax, and cast like bronzes.

‡ These coffins have been published by Mr. Richardson, the sculptor. The casts from which Mr. Richardson's plates were taken are in the possession of Mr. Sasse, the architect.

§ One also in the church of St. Mary Redcliff, at Bristol, which has worn well.—Ed.

* An exquisite top of one of these little boxes, representing six of the labours of the year, is preserved in the British Museum, with a large collection of pilgrims' tokens, as well as of other little objects in lead, principally from the museum of Mr. Roach Smith.

† If they were only copies of gold and silver work, we should find engraving.

lesser pewterer, which call for some little notice. 1. The counters, or mereaux, which are supposed to have done duty instead of copper coinage. 2. The mirrors. These latter we are assured by Vincent de Beauvais * were made by pouring hot lead over glass, and it is just possible that such a method might succeed if the glass were kept up to a sufficiently high temperature. Whatever might have been the process, it is a certainty that glass mirrors, with lead applied behind them, were well known articles during the Middle Ages.†

From Theophilus (book i. ch. 32), we learn that manuscripts were ornamented by means of tin ground into powder, and applied with gum much in the same manner as we now use gold shell. A varnish composed of saffron completed the imitation of the more valuable metal. Tin was likewise beaten out, and used instead of gold leaf,—varnished, of course; but the most curious application of it was to form the ground of what the good monk calls a translucid picture. A surface covered with burnished tin-foil had a subject painted upon it, with transparent oil colours,—a procedure which I suspect was followed with regard to the blank windows painted in imitation of stained glass in the cathedral at Florence.

Thus we have seen, although in a very imperfect manner, how important a part even the vilest of the metals played during a period when art was universal, and applied to all the purposes of life. The history of a metal becomes, under these circumstances, the history of almost all the arts. At present, unfortunately, we have no distinctive art; and, although much might be written concerning the useful purposes to which lead and tin are applied, I am afraid the art-history would be very small indeed. However, within the last few years we are beginning to amend; and, indeed, it would be folly to despair of an age which can produce such a picture as the Huguenot of Mr. Millais.

W. Burges.

THE LILLE CATHEDRAL COMPETITION.

Notwithstanding the fairness with which this competition was conducted to a certain point, with such honourable results to England, the committee have not proved true to the belief they inspired. On the ground of "the exigencies of public opinion," and the necessity for having the directing mind on the spot, they have placed the selected design in the hands of a local architect, and have made their bow to the authors of it, Messrs. Clutton and Burges, in some letters which are admirable specimens of what one part of the United Kingdom would call "blarney;" first, too, getting from the authors explanations and suggestions as to various proposed modifications.

The objections to the employment of an English architect urged by the committee, must have been evident to them before the programme was issued, and if so, they had no right to challenge the architects of England to compete; knowing as they must do, that it is not for the sake of the premium that an artist enters the list, but for the honour and profit of carrying his design into execution. The defrauded architects will find little consolation in the promise conveyed to them on the part of the committee, that their original idea being carefully preserved in the modified plan, will attach their names "to the edifice about to be erected, and be the means of transmitting them from age to age to posterity, surrounded by a glorious aureole."

Considering it would be undignified to continue longer to urge their claims to carry out their own design, our countrymen have closed the correspondence. It will be a subject of deep regret to all who wish well to art, that this competition which, in the first instance bore promise of being conducted with all the chivalrous spirit of the thirteenth century, will form no brighter spot in the history of art in the nineteenth, than the long list of disappointing, if not disgraceful, competitions which have preceded it. The Lille committee have had more praise than usual for what they did right in the first instance, and should not escape universal castigation for their ultimate breach of faith. We understand that the Lady Chapel has been commenced.

* In the cup attributed to him in the Print-room of the British Museum (why is it kept in the Print-room?), only one piece appears to have been cast: it is that containing the three small kneeling figures: this was wanted to be stronger than the rest, as the screw immediately adjoins it.

† See M. de Laborde, "Emaux du Louvre," vol. ii. article "Miroir."

MIDDLESEX INDUSTRIAL SCHOOLS COMPETITION.

Messrs. S. Smirke, P.C. Hardwick, and F. Pownall, who were commissioned by the magistrates to report on the designs sent in competition, pointed out seven, as the best, and showed, as we are told, various objections to each of these. The committee of magistrates put these aside, with one exception, and awarded the premiums as follows:—1st, to a design by Messrs. Aickin and Capes; the 2nd, to a design by Mr. Henderson (understood to be the steward of the Colney-Hatch Asylum); and the 3rd, to Mr. Moffatt, the last being one of the seven selected by the architectural referees. Further inquiry, however, showed the committee, it seems, that neither of these three designs was what they wanted; and they now have before them a design by Mr. C. Barry, which was neither one of the architect's seven, nor of their own three! Nothing, however, is yet settled.

After perusing this statement, readers will not be surprised to hear that we have received some strong remonstrances against the whole affair. It seems so strange a proceeding, indeed, that we shall wait to hear if the architectural referees have anything to say on the subject.

Many of the designs sent in were for prisons, we are told, rather than for schools, and in others ventilation, so important in a building intended to receive hundreds of children, was little thought of.

DEVIZES CORN-EXCHANGE COMPETITION.

Twenty-six sets of designs having been sent in for the proposed Corn-Exchange, two were selected, one by Mr. Phipps, of Bath, the other by Mr. Hill, of Leeds; and of these the former was chosen, and the premium, 20*l.* was voted to Mr. Phipps. No sooner, however, was this done, than some members of the committee entered into communication with the author of the second design, and at an ensuing meeting his plan was reproduced, with modifications; when the committee reversed their former decision, and passed a resolution in favour of Mr. Hill's design, leaving the premium in the hands of Mr. Phipps. The estimated cost of the selected design is 1,500*l.*

How much longer will architects degrade their art by submitting themselves to the caprice and ignorance of such tribunals. It used to be a belief that when things came to the worst, they would begin to mend; but we have been so long at what must surely be the worst as regards competitions, that we have lost faith in the maxim.

BASINGSTOKE CEMETERY COMPETITION.

At a meeting of the town council on Tuesday, the 22nd of July, thirteen designs and estimates for the new cemetery and buildings were considered, and ultimately the designs of Messrs. Poulton and Woodman, of Reading, were chosen. The chapels are in the decorated style of architecture, 30 or 40 feet in length, with steeples 70 feet high. The well-known ruins of the Holy Ghost Chapel will form the foreground of the whole. The second premium was awarded to Mr. W. C. Birch, of London.

NEW WESTMINSTER-BRIDGE.

The committee appointed in consequence of Messrs. Rendel and Simpson's observations on the scheme of the proposed bridge, and the desirability of proceeding with it, have made their report. They have "examined Messrs. Rendel and Simpson, and also Mr. Stephenson, Mr. Hawkshaw, and Mr. Fowler, all civil engineers. The two gentlemen last named were selected by Mr. Page, who was also examined.

A written statement has also been put in by Mr. Page, who also had every opportunity of suggesting such questions as he deemed fit to the witnesses."

The report goes on to say:—

"The evidence has satisfied your committee that the proposed piers are of strength amply sufficient to bear the weight proposed to be placed upon them; that the piers will be secure so long as the iron casting remains sound; that the iron casting can be replaced whenever it may decay or be destroyed; that such a mode of construction is less permanent and secure than granite piers, founded deep on the London clay by means of coffer-dams; but it is less expensive, and can be carried out in a shorter period of time, and causes less obstruction to the navigation of the river.

The changes that have taken place in the bed of the river and in the flow and ebbing of the tides of late years ought to have due consideration before determining the mode of construction and the headway under the bridge.

The witnesses examined before your committee differed somewhat in opinion as to the amount of any probable future change in these respects.

The report of the Select Committee on Public Offices, presented to the House during the sitting of this committee, contemplating extensive changes in the immediate neighbourhood and approaches to Westminster-bridge, has been brought to the notice of your committee.

Your committee are of opinion that, subject to the consideration of responsible professional advice to be obtained by the First Commissioner of Works, as to the security of the old bridge, the further progress of the works of the new Westminster-bridge should remain suspended until the Government have had an opportunity of considering and deciding on the advice to be offered to Parliament upon this last subject, when the site of the new bridge might be reconsidered in connection with any general plan of alteration and improvement of the neighbourhood, as well as the all-important subject of the headway under the new bridge.

Your committee, finding that upwards of 50,000*l.* have been already expended, subject to the foregoing remarks, subject also to some of the modifications and alterations suggested by the witnesses, are of opinion that the plan proposed might have been carried out."

NOTES ON THE INTERIOR DECORATION OF ENGLISH HOUSES.*

In our last paper we mentioned that tapestry and other ornamental work had to a great extent disappeared after the reign of George I. and that amongst the masses the unsatisfactory though wholesome practice of white-washing had supplied the place of more artistic matters. Engravings had fortunately to some extent come into use, and in a degree helped to supply the deficiency. There were also the framed portraits of this period painted in oil,—better by far in style than the common kind to be met with in publicans' parlours, at present.

The casts supplied by the Italians, who then as now wandered with them from place to place, were much admired, and we gave a sketch of a group of them a short time ago;† and it is a curious circumstance that the poll parrots, and painted cats, which thirty or forty years since were considered decent ornaments by people of tolerably good condition, although by them now repudiated, are reproduced and extensively sold amongst those whom art at the former time had not reached.

The effect of works of art placed familiarly in view is undoubtedly good, not only to the rising generation, but to those of mature years, who, though they may know nothing of art, cannot fail to be improved by the works of genius which daily front them in their breakfast and dining rooms. It may, therefore, be hailed as a fortunate era when Woollett, that famous English engraver whom no foreigner has yet equalled—Bartolozzi, and the man who combined with so much skill the functions of the moralist, painter, and engraver—diffused their works from one end of the kingdom to the other. The greater part of the engraved prints of this time were, however, too expensive to be common amongst the lower or middle classes.

No man in his generation did more to promote the distribution of works of art throughout English dwellings than William Hogarth, who was a Londoner, born in a court in the Old Bailey, and who in due time was apprenticed to a sort of general engraver in Doctors'-commons. Like other great men, Hogarth had difficulties to contend with, and liked, when by industry and application he had got into a good position, to speak of the times when, after a course of dinners with Duke Humphrey, he has, on the completion of a plate for the publisher, buckled on his sword, and marched to see the life in town; on such occasions no doubt gathering up part of the valuable knowledge of human nature which he afterwards so ably used.

* See p. 311, *ante*.

† See p. 306. The benefits which have resulted from the labours of the itinerant Italians, in the diffusion of taste in both art and music in this country, has not been sufficiently acknowledged.

With his skill as an artist, Hogarth combined no small amount of shrewd business habits, which caused his ability to be doubly useful to the community. At the sign of the "Golden Head," in Leicester-square, he for many years disposed of his works in a manner which will be understood by the following quotation from one of the prints of the day:—

"Mr. Hogarth is publishing, by subscription, a print representing the March to Finchley in the year 1746, engraved on a copper plate, 22 in. by 17, price 7s. 6d. Subscriptions are taken at the Golden Head, in Leicester Fields, till the 30th of this inst. and not longer, to the end that the engraving may not be retarded.

"Note.—Each print will be half-a-guinea after the subscription is over. In the subscription book are the particulars of a proposal whereby each subscriber of 3s. over and above the said 7s. 6d. for the print will, in consideration thereof, be entitled to a chance of having the original picture, which shall be delivered to the winning subscriber as soon as the engraving is finished."

The subscription-list was closed, 1,843 chances being subscribed for. Mr. Hogarth gave the remaining 167 chances to the Foundling Hospital, and the fortunate chance was 1,941, which belonged to the hospital. Mr. Hogarth the same night delivered the picture to the governors of the institution.

The following list will show more clearly the prices at which Hogarth distributed his works:—

The Distressed Poet, 3s; four etchings of different characters of heads in groups, viz.: Chorus of Singers, a Pleased Audience at a Play, Scholars at a Lecture, and Quacks in Consultation, price 6d. each; Morning, Noon, and Night, and a Company of Strolling Players, for one guinea.*

	£.	s.	d.
Six Harlot's Progress, at 14 guineas each	88	4	0
Eight Rake's Progress, at 22 guineas each	184	16	0
Morning, 20 guineas	21	0	0
Noon, 37 guineas	38	17	0
Night, 26 guineas	27	6	0
Strolling Players, 26 guineas	24	6	0
	£427	7	0

In 1751 Hogarth published two large prints, Beer-street and Gin-lane, at 1s. each; a number printed in better manner, 1s. 6d. each; also four prints on the subject of cruelty, price and size the same. Hogarth said:—"N.B. As the subject of these prints was calculated to reform some reigning vices peculiar to the lower classes of the people, in hopes to render them of more extensive use, the author has published them in the cheapest manner."

In addition to the good done by Hogarth by the production of his prints, both English art and artists were benefited by the exertions which he made to secure an enactment for the protection of the copyright of pictures and engravings.

In 1735, an Act of Parliament was passed, which to a considerable extent protected the engraved works of artists from piracy. In acknowledgment of this, Hogarth engraved a small emblematical deviee.

The passing of this Act caused the artist to proceed with renewed vigour with his works. This enactment did not, however, effectually protect Hogarth's works from piracy, and he allowed authentic copies of some of his prints to be made on a small scale, which were sold by the booksellers at 2s. 6d. the set.

Amongst the engravers of the last generation, whose works were much appreciated, was John Scott, who did also good service by the productions of some fine prints, large and small, of sporting subjects, which are still highly prized. The way in which this artist learned his art, is encouraging to young men who may have an instinctive feeling for art. Mr. Scott, when a lad, was apprenticed to a tallow-chandler at Newcastle-on-Tyne. By some chance he had seen an engraver at work, and was anxious to make an attempt to follow his example. He procured a graver, but could get no polished copper to work upon. This obstacle he overcame by beating out pennypieces, which he carefully prepared, and in course of time by practice acquired considerable skill, and eventually found his way to London, where for many years he was extensively employed.* Since the time of Bartolozzi, Hogarth, and Woollett, English engravers have, by the multiplication of good pictures, added much to the adornment of English houses.

Before the days of Thomas Bewick and his brother Robert, illustrated literature was by its high price confined almost entirely to the affluent. Most families had a folio Bible, in which were descriptive prints: these, however, were purchased by careful saving, at a great price. The course of these talented men was soon followed by several worthy examples, and wonderful indeed has been the increase in both knowledge and taste which has been caused by the plentiful and still increasing supply of cuts and engravings. Every lover of elegance and refinement, and all who have at heart the success of this nation, both in art and manufactures, must consider this result with satisfaction. The general advancement of taste must improve the designs of goods required for domestic and other purposes. In many instances manufacturers of good taste themselves are obliged, contrary to their will, to send into the market abominable things, because more likely to find purchasers than better works.

The introduction of stencilling, or *slabdashing*, as it used to be called, effected a lively change in a multitude of English dwellings; and many of the patterns worked on the prepared wall, although simple and unpretending, produced what was needed, namely, a broad and harmonious effect, which affords relief without intruding in patches upon the eye,—a fault of many of the papers used on walls at present. We will give an instance which first comes to our recollection. A small room, about 15 feet square—a size very common in London—is covered with a large florid and distinct pattern of Louis Quatorze style: four and a half of these ornaments reach to the ceiling, and six and a half from side to side; the flowing lines are of a very pale, sickly grey, with white catching lights, thrown out by a dark background of indigo. This destroys the beauty of the best prints, drawings, or pictures. The room, small as it is, is made to look much smaller; and the eye wanders without repose painfully from place to place.

We could give scores of instances of the bad taste shown in the choice of patterns on our walls. The difficulty would be to find many in which it is not.

In the choice of paper for the walls of rooms, it ought to be borne in mind that in most instances the covering of walls is only a background for prints, water-colour drawings, or paintings: rooms may be seen hung with valuable drawings, papered with the gayest coloured flowers. The force and beauty of works of art are completely destroyed by such a mounting. In addition to the bad choice of the paper, much damage is often done to prints and pictures, which now supply the place of the ancient tapestry, by the style of the frames.

Although the graceful care of women has a greater influence on the homes of England now than in the days of our Saxon ancestors, and during the Middle Ages, still the actual amount of female handiwork is comparatively small; the production of tapestry may be said to have died out with Miss Linwood, that persevering artistic needle woman. These works differed from the old wall coverings, and were endeavours to imitate paintings in oil, rather than to produce an effect suitable to the particular material.

Mr. Timbs tells us that Miss Linwood worked her first picture when 13 years old, and the last piece when she was 78. The designs were executed with fine crewels, dyed expressly for her, and were entirely drawn and embroidered by herself. In 1785 the pictures were exhibited to the royal family at Windsor; next in the Pantheon, Oxford-street; removed in 1798 to the Hanover Square-rooms, and then to Leicester-square. The collection consisted of sixty-four pictures, including a portrait of Miss Linwood, at 19, from a crayon painting by Russell; "Head of St. Peter" (Guido); "Woodman in a Storm" (Gainsborough), &c. The pictures were sold by auction by Christie and Manson, at Saville-house, April 23, 1846, when the "Judgment upon Cain," which occupied ten years working, sold for 64*l.* 1s.; the price of neither of the other pictures exceeding 40*l.*; the original, "Hubert and Arthur," by Northcote, sold for 38*l.* 17s. The entire sale did not realize 1,000*l.*

* The original picture of the Strolling Players was sold to Francis Beckford, Esq. for 27*l.* 6s. and by him returned in consequence of its high price; it was afterwards sold for the same sum to Mr. Ward, of Littleton.

* At about this time it was fashionable, especially amongst sporting gentlemen, to wear buttons of large size, which were often beautifully engraved with original designs. Scott, Bewick, Hogarth, and other eminent engravers, engraved on this description of work, for which large prices were paid.

METROPOLITAN BOARD OF WORKS.

At a meeting held on the 29th of July, Mr. Thwaites in the chair, the motion proposed by Mr. Doulton, and seconded by Mr. Hows, as mentioned in our last,—

"That the engineer be directed to prepare a plan, section, and estimate, for extending the main outfall sewer on the southern side, to a point in Long Reach, below Erith, and so as to be discharged at and after high water only,"

was carried; the amendment thereon, proposed by Mr. Wright, and seconded by Mr. Wilkinson,

"That the engineer be instructed to report on the desirability of carrying the entire sewage of the metropolis by means of one large tunnel to Sea Reach,"

being lost.

An amendment proposed by Mr. Carpmael,

"That the plan recommended by the engineer in his report of the 7th of July, be now adopted, with the proviso that the sewage shall be discharged into the river within one hour after high water, so as to preclude the return of any part of it within the limits of the metropolis, as defined in the Metropolis Local Management Act,"

was withdrawn *pro tempore*, to be brought forward as a substantive motion hereafter.

Mr. Wright's motion,—

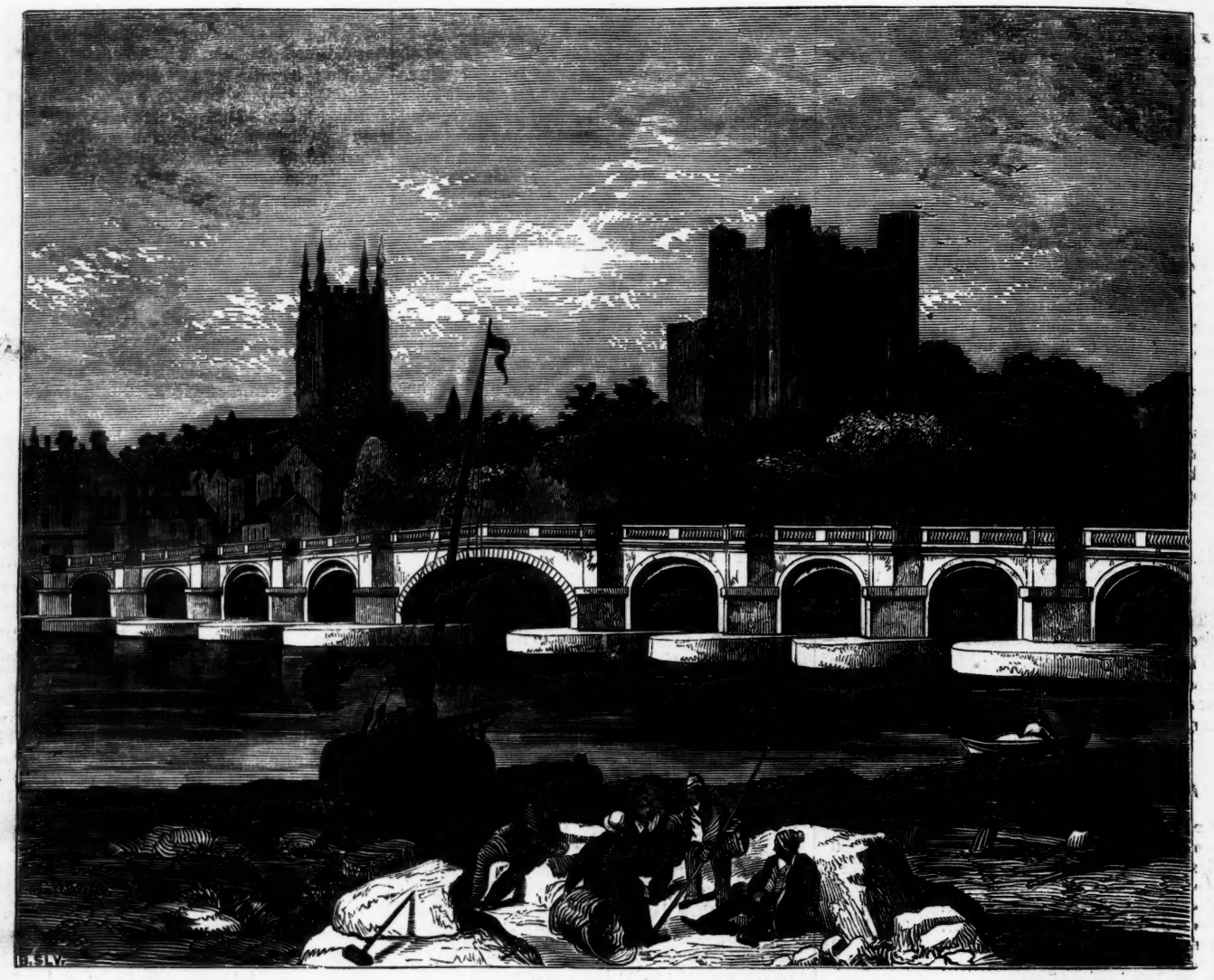
"That the low-level sewer, as delineated on the northern side of the metropolis, be adopted, subject to a variation from Hungerford to London-bridge, in case the Thames embankment be carried out within such period as will enable this Board to comply with the requirements of the Metropolis Local Management Act,"

was carried by 21 for, to 7 against.

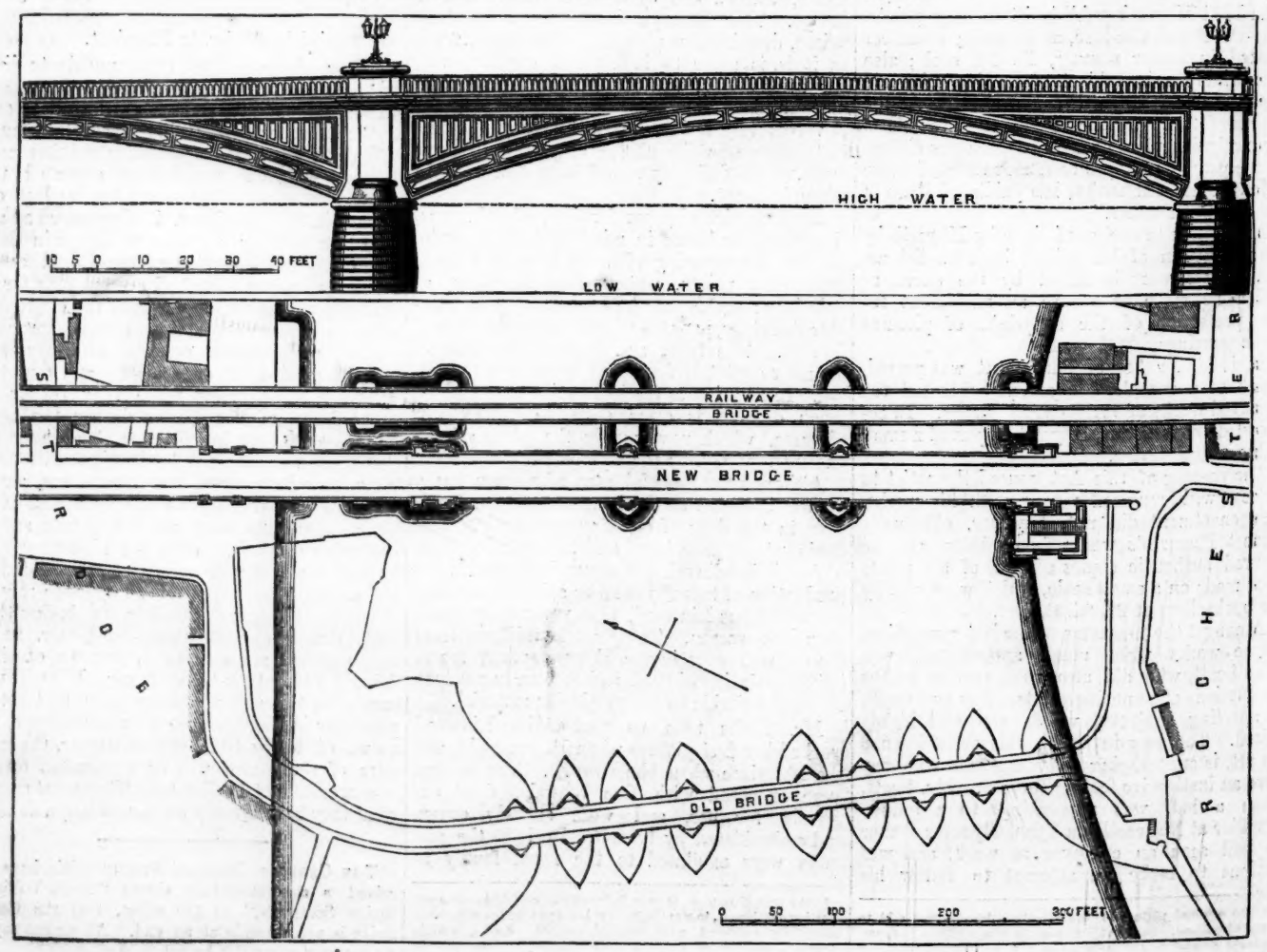
We confess ourselves quite unable to divine what the real views and intentions of the Board on the subject are, and we are forced to come to the inference that, feeling themselves incompetent to the task of draining and improving London,—no one could have expected they of themselves would be,—and having lost confidence in their engineer, if they ever had any, they are seeking a chance of escape in delay. The clear-headed portion of the Board cannot seriously believe that their present plan for the drainage of the northern side of the metropolis, with its erroneously-stated details, proposed outfall, and monster cesspool of thirty acres, will be carried into execution; and doubtless grieve in their hearts when they review the proceedings of the Board during the seven months it has been in existence. They must feel that up to this moment, however good its intentions may have been, the Board has simply proved an obstruction to improvements of all kinds: there has been no end of talk and no beginning of work. With the kindest possible feeling we would urge upon them the immediate and pressing necessity for an opposite course; at the same time, nevertheless, reminding them that in their case it would be better, so far as the public are concerned, even to continue doing nothing than to do wrong. We will venture upon this one prognostication, that if they persevere in their present plan of drainage, and go with it to the Chief Commissioner, the existence of the Board will be terminated on the re-assembling of Parliament. They must rescind what they have already done, and begin *de novo*.

The Cardiff Masons' Strike.—We have received a communication, signed "Mark Williams, Strike Secretary," to the effect, that the Cardiff strike is *not* virtually at an end. All we can say is, we are very sorry if it be not.

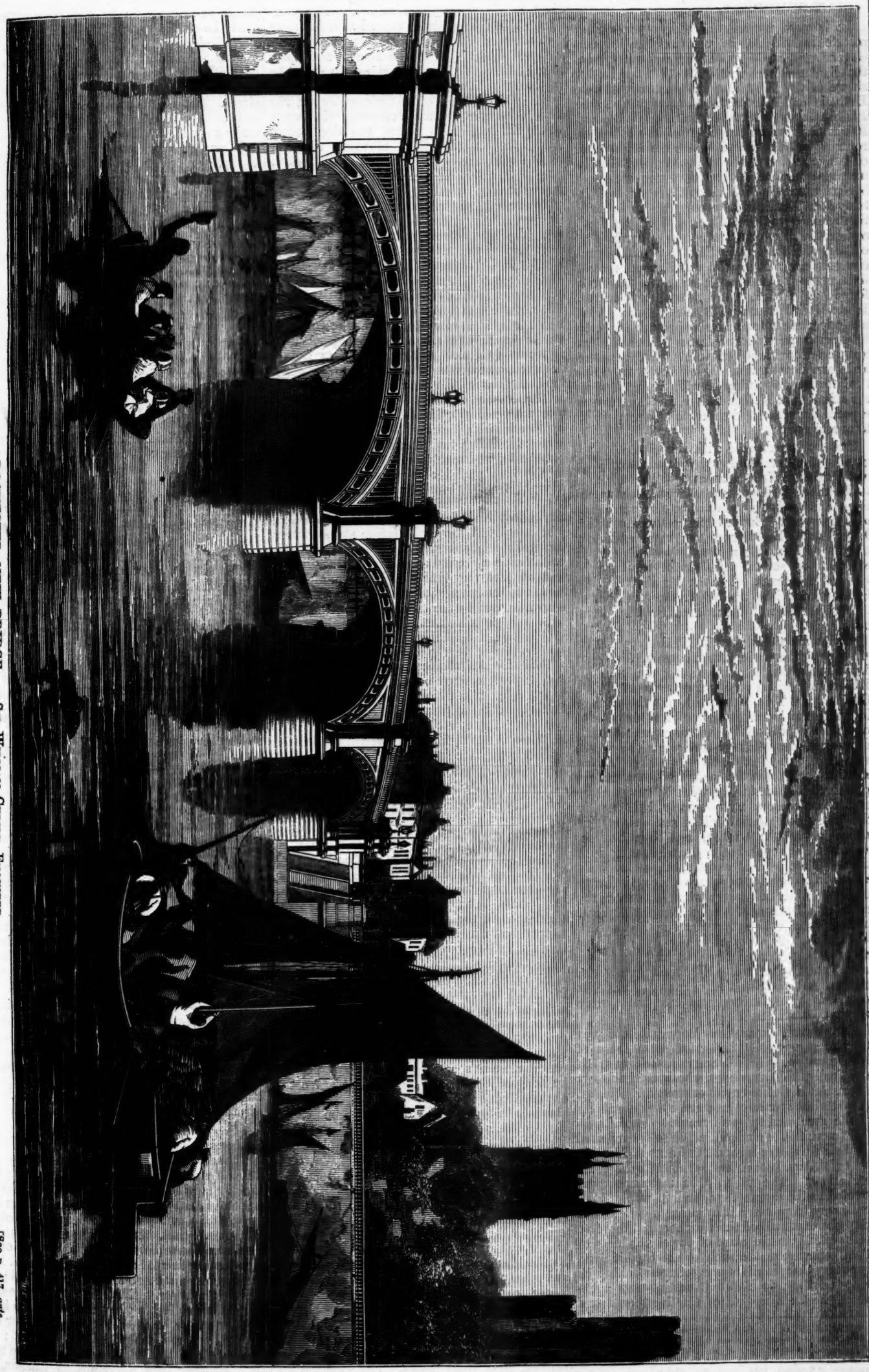
THE OLD BRIDGE AT ROCHESTER.



ROCHESTER NEW BRIDGE: ELEVATION OF PART.



Plan showing position of the Old and the New Bridge.



ROCHESTER NEW BRIDGE.—Sir William Cubitt, Engineer.

[See p. 417, *ante*.

THE ANTIQUITIES OF THE CRIMEA, FROM THE LATEST OFFICIAL RUSSIAN SOURCES.*

It is now upwards of thirty years since private individuals, as well as the Russian Government, made excavations on both sides of the Kimmerian gulf and the interior of the shores of the Mæotis, amid the ruins of the old Hellenic and Miletus colonies. Among them, Pantikapœum (Kertch) occupied the first place. It was there where the deputies of all the surrounding nations assembled for the deliberation of public affairs, and it was thence that Grecian merchants extended their immense commerce beyond even the Cobi desert. It was at Pantikapœum that Herodotus collected his information relating to the uttermost countries north and east, whose caravans stopped at this first outpost of European civilization. Under such circumstances, it may be considered fortunate that many of the art-treasures successively found at Kertch were transferred to the Imperial collections of St. Petersburg. Still many specimens, too unwieldy for such a lengthy transport, were destroyed during the events of the last war. The chief objects of this kind, however, had been deposited in the new museum, which the late emperor was building for ten years, under the direction of M. Von Klenze, and there was an especial department devoted to this purpose by the architect.†

This work, published with the greatest typographic care, far excels every other description or delineation of Crimean antiquities; and it is to M. Piccard, the French artist, that the credit is due of so ably depicting these fine ornaments of Grecian art. Besides him, a Russian artist, M. Solatzeff, has figured the vases and other objects of clay, glass, wood, &c. The text is compiled by several members of the Imperial Russian Academy. The explanations of the Greek inscriptions are by M. Stephani, one of the conservators of the Museum of St. Petersburg.

It was about the year 1802, that some coins of Olgia, Theodosia, Pantikapœum, &c. were found in the Crimea; and in the year 1805, M. Koöhler described the mausoleum of Queen Camosarya. This monument, of the highest interest, has been destroyed, and it is also obvious that all similar buildings subsequently discovered were left to their fate, after the officers in charge of these excavations had removed every object of value. The drawings preserved of them in the work before us, show that these edifices were mostly built within the folds of those hills and mountains which cover the Crimea, and then became, as it were, hidden between them in the lapse of time. They consist mostly of vaults, built either in a circular or square shape, similar to buildings of this character found in Greece; the so-called *Thesaurus* of Agamemnon, at Mycene, having been entirely preserved. The square blocks of stone, very regularly cut, lap one above the other, and form an oval vault, the upper opening of which is closed by a stone, especially shaped for that purpose. Pausanias says, that by it *harmony* and completion were brought into the building.

Successively excavations increased from year to year; especially important were those of M. Dupru in 1816, M. Stempgrowski in 1831, and finally, M. Blaramberg, who was particularly successful in finding gold ornaments. Finally, these endeavours were crowned by the discovery of the great and splendid mausoleum of *Raoul-Oba* (mountain of cinders), which fully confirmed the belief that the highest specimens of Hellenic art existed on these shores, inhabited by Scythian barbarians. The Raoul-Oba monument was erected in the square form, and it would have been easy to preserve it by means of beams, &c. One glance convinced the searcher, that they had penetrated into the grave of one of the kings of Pantikapœum, as the skeletons of the king and queen lay there in all the array of ornaments which followed them to their last resting-place; diadems, neck-chains—all of the finest gold and workmanship—together with arms, vases, utensils and figures of amber, forming a mass sufficient to fill up a whole museum. But as no sentries had been placed around after its being opened, much of its contents was carried away and purloined. One of the hillocks now open, called *Aldem-Oba*, the Gold Mountain, shows by its name the fabulous amount of treasure found in these oldest lands of the Golden Fleece. The illustration of these ancient art-relics will occupy eighty-six large folio plates, and they follow according to the material of which they are made—gold, amber, ivory, silver, bronze, glass, burnt clay, vases and other figures, wood, besides inscriptions and coins. Of iron, there is a helmet of the most curious composition, unique in its way. Most interesting are the specimens of gold: diadems, crowns made of leaves, of which there are enumerated twenty-one; carvings of endless variety of human and animal form; neck-chains, agraffes, arm-chairs: most of these are ornamented with cut stones. Among them even shines forth the breast-covering of the queen, which consisted of several rows of ornaments: on its upper part appears a great medallion, representing Pallas Athene, which, as is duly observed, corresponds with the description given by Pausanias of the head of Pallas by Phidias in the Parthenon of Athens. It corresponds also with the *entaglio* of Aspasias, represented by Stosch in his famous work. If we take into account the high and pure style of these costly ornaments, we cannot doubt that they appertain to the best period of Greek art, and had been brought from Athens for the Royal house of Pantikapœum. The period alluded to is that of the end of the Peloponessan war and of Phidias, whose colossal toretic Palladion at the Athens Acropolis might have been the pattern of this imitation in a precious metal. We may observe that at that very time King Leukon, of Pantikapœum, was an ally of the Athenians, and had been honoured by the citizenship of Athens.

* "Antiquités du Bosphore Cimmérien." Antiquities of the Cimmérian Bosphorus, preserved in the Museum of the Hermitage. Published by order of His Majesty the Emperor. St. Petersburg: Printed at the Printing-office of the Imperial Academy of Sciences. 1854. 2 vols. fol. Plates.

† *Vide* an anterior vol. of *Builder*.

PROVINCIAL NEWS.

Saltash.—An accident, says the *Devonport Independent*, occurred, on Monday before last, to the cylinder in which the centre pier of the Saltash bridge is being built. For the convenience of the workmen, some of the stays had been removed from the internal part of the cylinder, and the upper part collapsed under the immense pressure from the force and weight of the tide. Fortunately no one was injured. A telegraphic message was sent off immediately to Mr. Brunel, the engineer. It also fortunately happens that the pier is 2 feet above low water-mark.

Tavistock.—The opening the new British Schools here took place on Saturday before last, in presence of the Duke and Duchess of Bedford, Lord John Russell, and others. The building is in the Old English style of architecture, and consists of three school-rooms, one appropriated to boys, a second to girls, and a third to infants of both sexes. The boys' room is 65 feet by 31 feet, the girls' 58 feet by 25 feet, and the infants' 50 feet by 25 feet, in addition to which large class-rooms and lavatories are attached to each school. Large playgrounds are also provided for recreation. Accommodation is thus afforded for about 650 children. The space of ground occupied by the building is 164 feet by 170 feet. The cost of the erection, defrayed by the Duke of Bedford, amounts to 3,000*l.* The schools were built by Mr. Goslin, of Torquay, on the design of Mr. Rundle, of Tavistock, architect; the plans had been previously approved of by Mr. Bowstead, one of her Majesty's inspectors of schools.

Worcester.—Mr. Hawksley's specifications for the water-supply and drainage works of this city were left at the town-clerk's office last week, for the inspection of persons wishing to tender, and applications from London, Glasgow, Staffordshire, Chester, Derbyshire, Worcester, and other places, have been made for particulars. Those connected with the water-supply are divided into three separate portions, one for the engines and works connected therewith, another for the iron pipes, and a third for laying down the pipes. They are voluminous, and being printed, form three books. The specifications for the drainage works and proposed forms of tender make two books of about thirty pages each. Altogether, there will be 15¾ miles of drains and sewers to be laid down. Tenders are to be sent in by the 9th of August.

Ballsall Heath.—The foundation-stone of new schools for this district was laid on 17th ult. by Mr. W. F. Taylor, of Moseley-hall, on a site of land purchased for the building in Vincent-street. The schools are to be named St. Paul's, and will be erected by Mr. W. Smith, from designs by Mr. F. Empson. They will include boys' and girls' schools, each about 80 feet by 18 feet; an infants' school, 50 feet by 24 feet; three class-rooms, and a master's house. The main features of the design are Tudor, but the infant school gable will be pierced with a triple lancet. This gable will be surmounted by a bell turret. Each of the school-rooms will be open timber roofed. The material throughout will be brick, with stone dressings. The estimated cost is about 1,700*l.*

Saltley.—The building intended to be used as a public library and museum approaches completion. It is Venetian in character, and was designed by Mr. Street, of Oxford. A bazaar is intended to be held in August, in the Town-hall, to provide funds for the endowment and furnishing of the museum.

Birmingham.—The new museums at Queen's College are now nearly completed. On the site of the former edifice a suite of museums have been built, consisting of three rooms, each about 40 feet square. The first or lower room, which is 20 feet high, is entered from the quadrangle of the college: it is intended for anatomical preparations, and will have galleries on three sides, and be lighted by large mullioned windows, looking into the quadrangle. The second (or ground floor on the Paradise-street level) is similar to the lower museum, but of less height. It is intended for mechanical models and other objects connected with the engineering department, the professors in which will also use it as a lecture-room. The third, or upper museum, is the principal apartment, being 40 feet square, and about 40 feet high. It is surrounded by two tiers of galleries, and is lighted from the roof. This museum, which will be open to the public, is destined to receive the general collection of the college. The ceiling is divided by intersecting ribs into sixteen panels, with open tracery in each. The walls have piers projecting about 18 inches, and about 6 feet apart, running the whole height of the room. Between these piers are to be placed the glass cases for specimens, an arrangement which extends to all the museums. In front of each of the wall piers in the different museums pedestals will be placed to receive busts of eminent scientific men. The warming and ventilating are proposed to be carried out on the most complete system that can be adopted. The designs for the building were furnished by Mr. J. J. Bateman, the architect of the college. Further alterations and improvements to a considerable extent are contemplated. The cost of the new museums will be upwards of 2,000*l.* for which donations are still being solicited.

Lichfield.—The new schools erected in the village of Shenstone, were formally opened on 23rd inst. The schools are three in number, and are calculated to hold 130 children daily, and, together with a master's residence, are erected upon ground presented by Mr. T. Bagnall. The architect was Mr. W. Baker, of Birmingham; and the builder was Mr. T. Hassall, of Shenstone.

Lincoln.—Notwithstanding the great demand for houses in Lincoln, and the rapidity with which the same are being run up, building land, says the local *Chronicle*, is being brought into the market in such large quantities, that prices have receded to a point which enables all to purchase. Within the last few weeks, numerous lots, within a short distance of the centre of the city, have been sold at auction by Mr. R. Hall, at an average price of 5s. per square yard; and lots on the Conservative Land Society's estates were taken at 18d. a yard, and many lots in St. Botolph's have been sold at 2s. Building land in Newport can be had at 3s. per yard; and Above-hill, in the Bail, several houses are to be let. Building land, therefore, in Lincoln, can now be purchased at a reasonable rate, and it is

anticipated that an amount of building will shortly take place.

Shields.—It is said to have been determined by the Piers and Public Works Committee of the Commissioners of the river Tyne to submit to that board a project for going to Parliament next session to procure powers to make another new public dock on the river for shipment of coal. The site projected is the Coble Dene in Shields harbour; and, if made, it will be principally used in shipping steam coal from the Hartley coalfield. The Northumberland Dock, which is being made by the Commissioners for the same purpose, is making progress, and it is anticipated will be opened in the spring of 1857. When the works of the Jarrow Docks, which the North-Eastern Railway Company is making upon the Durham side of the Tyne, are finished, it is anticipated that facilities will be afforded for the shipment of above 3,000,000 tons of coal in the year. Those extensive marine works, the north and south piers at the mouth of the Tyne, which have been undertaken by the River Tyne Improvement Commissioners, are being proceeded with this summer. The public works now in hand upon the Tyne, and projected, are estimated at above 3,000,000*l.* sterling.

Kirkaldy.—The harbour repairs are proceeding, though slowly—men being rather scarce. Good masons are getting 5s. a day at the erection of Lochgelly Free Church. Mr. Russell, manufacturer, is rearing a mansion on his property adjoining Oswald's Wynd. Mr. Nairn, manufacturer, has also broken ground for a dwelling-house on the green flat of ground adjoining the harbour branch of the Edinburgh, Perth, and Dundee Railway Company.

Derry.—The construction of a new line of quays at Derry has been commenced by the contractor, Mr. William M'Cormick.

County Down.—A new Crown Court-house for Down is to be constructed in that portion of the Court-house at present occupied by the offices of the treasurer, clerk of the crown, and secretary, to be of the same size as the present Record Court; and new offices built in the rear. The present hall is to be increased in size, and to have a public staircase leading to the grand jury-room, secretary and county surveyor's offices, and the galleries of the Crown and Record Courts. The grand jury-room will occupy the same position as in the present building, but be increased in size, and have staircases leading to the Crown and Record Courts. A portion of these alterations will be proceeded with as soon as possible, in order that the courts, grand jury-room, and judges' rooms should be ready for occupation at the next assizes. The total cost of the alterations is estimated at about 4,000*l.*, 3,000*l.* of which are at present in the hands of the treasurer, and available for the purpose of the alterations.

MR. PENNETHORNE, ARCHITECT AND SURVEYOR OF H.M.'s PARKS, PALACES, AND PUBLIC BUILDINGS.

The following gratifying memorial has been addressed to Mr. Pennethorne by a large number of his professional brethren. We give publicity to it with great pleasure:—

London, 1st July, 1856.

Dear Sir,—Your professional brethren are anxious to congratulate you on the successful completion of your design for the western wing of Somerset-house, in which, at the same time that you have adhered to the taste and style of the original edifice, and have done full justice to the genius of Chambers, you have adapted these additions to a difficult site with great propriety, and thereby produced a striking architectural feature in the entrance to London by Waterloo-bridge.

We avail ourselves of this opportunity to express our sense of the ability with which you have treated various other public buildings, which you have been called upon to erect as an officer of the Crown, and carried out the metropolitan improvements confided to your management.

During a long professional career, many of us have had occasion to transact public business with you in your official capacity. On every occasion we have experienced from you the readiest access, as also the greatest courtesy and frankness. While every application has been met with all the facility that your office could afford, we have had to recognise the skill and intelligence which you have habitually brought to bear upon complicated and difficult questions of a technical nature, and the most anxious attention to protect the public interests in the very extensive purchases of property entrusted to your care.

Impressed with these feelings, we desire to offer you a mark of our cordial respect for your character as an architect and surveyor, and for your bearing as a gentleman; and understanding that the "Art-Union of London" have in preparation a medal of Sir William Chambers, with a representation of the Strand front of Somerset-house on the reverse, we have applied to the council of that body, and have received their consent to have an impression *struck in gold*, which, as soon as executed, we shall request you to accept, as a mark of the kindly feeling of regard borne to you personally by your professional brethren.

Signed by—

Samuel Angell
Thomas Bellamy
William Tite
Arthur Ashpitel
John J. Cole
Philip Hardwick, R.A.
C. R. Cockerell, R.A.
Sydney Smirke, A.R.A.
Charles Barry, R.A.
Thomas Henry Wyatt
George Pownall
Edward I'Anson
Charles Mayhew
H. Mawley
George Mair
Edward C. Hakewill
Charles Barry, jun.
Charles Charnock Nelson
William Snooke
John Hammack
Henry Clutton
Frederick Marrable
W. J. Gardiner
Ambrose Poynter
J. H. Good, jun.
James Howell
George Smith
Samuel Beachcroft
Harry Oliver
George B. Williams
Sancton Wood
Henry Clutton, Whitehall-place
James Bell
J. H. Lewis
J. J. Scoles
Talbot Bury
W. J. Booth
Martin Joseph Stutely
J. H. Good, church commissioner
Charles Parker
A. Salvin
John Shaw
John Henry Hakewill
George Godwin
Owen Jones
Henry Baker
M. Digby Wyatt
Andrew Moseley
John Gibson
John Davies
Decs. Burton
H. E. Kendall
Henry Harrison
P. C. Hardwick
Benjamin Ferrey
William Railton
Henry Garling
Robert Hesketh
Edward M. Foxhall
George Gutch
Charles Beachcroft
Thomas L. Donaldson
James Thomas Knowles
Charles Fowler
William Hosking
William Mosely
William G. Habershon
Edward Habershon
Francis Edwards
David Mocatta
Ewan Christian

CHURCH-BUILDING NEWS.

Dorchester.—St. Peter's Church, which has been undergoing a process of restoration for the last eight or ten months, has been reopened. The subscriptions to begin with amounted to about 800*l.* The preparation of the necessary designs was entrusted to Mr. John Hicks, of Dorchester, under whose superintendence as architect the restoration has been carried out by Mr. John Wellspring, builder. The restoration includes the taking down the old east end, and the building of the new one, by which an addition is gained in length to the chancel of some few feet, and forming the eastern elevation, in the centre of which has been placed a traceried window, in common with the other characteristics of the edifice. This window is a gift of one or two private individuals. Carved heads of her Majesty and the Bishop finish the hood-moulding round the east window. The marble monument to Lord Holles, which once stood at the eastern extremity of the south chapel, thus blocking up the window therein, has been removed to the western extremity of the north aisle. The whole of the arches and piers have been made good with Caen stone, and the inside jambs, mullions, and tracery heads of the windows have been replaced by new ones in Bath stone, except where, in the chapels, they were of Hamhill stone, and have been replaced by similar material. The whole of the plastering has been removed and renewed, the ceilings whitened, the two semicircular and unecclesiastical dormer windows on the north and south of the nave, giving light to the old gallery (which is now removed), have been done away with, and the roofing continued. The chancel is raised one step above the church floor. The flooring is laid with Minton's encaustic tiles. The monuments throughout have been cleaned, and arranged uniformly between the windows, which have likewise been reglazed with new lead diamond lights, which portion of the work has been executed by Mr. W. Durden. The west or tower window is filled with stained glass, from Messrs. Bowden and Co.'s establishment, at Bristol, being the gift of Mr. Herbert Williams. The east window has been filled with stained glass, representing "The Ascension of our Lord," with emblematical figures in the tracery, by Mr. Hardman, of London. A new roof has been placed on the chancel, of a semicircular form, plastered between the ribs, which are stained in oak. The church has been refloored, and repewed with deal open benches, capable of accommodating upwards of 460 adults, about 200 being free. The old ringing floor has been taken down, and a new one placed over the crown of the tower arch, the underside forming a ceiling, which is stained and varnished. The organ is now placed in the north chapel, raised on a platform, and was removed, repaired, and refixed by Mr. H. Jones, organ builder, Brompton. The apparatus for warming the edifice consists of a Dorset stove, burning charcoal—the architect's invention—which has been placed in a reservoir under the pavement in the middle aisle, covered by an ornamental open ironwork plate, the draught of air being brought in by means of pipes under the floor, so that no room is lost in the church. Some other necessary works have been omitted for want of funds, and at least 500*l.* will be yet required to complete the restoration.

Warwick.—A new church has been opened in the parish of St. Nicholas, Warwick. The church, dedicated to All Saints, stands on a site presented by the Earl of Warwick. It is built in the Decorated style of architecture, and consists of nave, south aisle, chancel, south chancel aisle, and north and south transepts. A vestry is on the external north side of the chancel. On the western side of the south transept is the tower, the principal entrance to the interior, and intended to be hereafter surmounted by a spire. The interior, calculated to afford accommodation for 580 persons, is fitted with open benches, and the chancel with stalls. Two-thirds of the sittings are free. The walls are constructed of brick, with blue lias stone facing and moulded work. The tracery and other dressings, internal and external, are of Bath stone. The roofs are constructed of open framing of Memel timber, stained and varnished, and are covered externally with tiles. The architect was Mr. James Murray, of Coventry. The contract for the whole was 3,100*l.*

Hatfield Chase.—We are asked to state that Mr. Archer Houblon was a liberal donor in respect to the new churches to be erected at Hatfield Chase, and not the "builder" of them.

Eridge-green. — The chapel at Eridge-green, some time since built at the sole expense of the Earl of Abergavenny, was consecrated on Wednesday before last, by the Bishop of Chichester. A district of some extent, taken partly from the parish of Frant, and partly from the parish of Rotherfield, has been annexed to it by an order of council, and by the act of consecration it has become a district church by the name of the Holy Trinity. A burial ground for the use exclusively of the inhabitants of the district has been also given.

Birmingham.—A memorial window, designed by M. Alfred Gerente, of Paris, was some time since inserted in the eastern-end of Holy Trinity Chapel, to the north of the altar. The corresponding window, south of the altar, has recently been filled with stained glass by the same artist, in memory of the late Mr. Isaac Marshall. The design consists of scenes from the life of the Saviour, enclosed within quatrefoil-shaped medallions, placed on a decorated floral ground. Amongst the scenes chosen are the Baptism, the Transfiguration, the Agony in the Garden, the Ascension, and the raising of Lazarus. In the head of the window is placed the Agnus Dei, and at the foot is an inscription setting forth the object of the memorial.

Magherafelt. — On St. Swithin's-day, the foundation stone of a new church, was laid in Magherafelt, according to the *Coleraine Chronicle*. The site was granted by the Salters' Company, together with the sum of 4,000*l.* to assist in the building. The work is progress-

ing under the superintendence of the contractors, Messrs. Henry and Sons. The edifice is to be named St. Swithin's Church.

Berwick-upon-Tweed.—The new burial-ground here has been consecrated by the Bishop of Manchester. The consecrated chapel is lighted by a five-lighted traceried window at the east end, three two-light windows on the south side, and one on the north. The unconsecrated chapel is lighted by seven traceried windows of varied design. Each chapel will accommodate about fifty persons. The buildings are all constructed of the local building stone, except the window tracery and finer portions of the work, which are from Swinton. The buildings and the laying out of the ground are from a plan furnished by Mr. Robert J. Johnson, of Newcastle, and selected from twenty-five plans submitted to the Burial Board.

LONDON AND MIDDLESEX ARCHÆOLOGICAL SOCIETY.

This society held its first annual general meeting on Thursday, 24th July, at the Architectural Museum, Canon-row. Lord Robert Grosvenor, M.P. occupied the chair in the morning, when it appeared from the balance-sheet that the total receipts, including a donation from Lord Londesborough of 20*l.* amounted to 202*l.* 3s. 6d.; the total expenditure was 108*l.* 12s. 3d. leaving a balance in hand of 93*l.* 11s. 3d. The members and visitors then adjourned in a body for the purpose of visiting Westminster Abbey, under the guidance of Mr. Scott and the Rev. Charles Boutell, M.A.

At eight o'clock the members and their friends again assembled in the Architectural Museum, where a *conversazione* was held; the Rev. Thomas Hugo in the chair.

The first paper read was by Dr. Bell, upon the royal badges which appear upon the royal monuments of the abbey. The second was by the Rev. Thomas Hugo, on the structures which preceded the present Abbey Church. A letter was then read from Mr. W. H. Cowper, upon some Roman remains which were discovered during the early portion of the spring in making some excavations at Mr. Hemming's Iron Works, at Bow (close to the line of the old Roman road).

THE METALS.

The iron trade as yet shows no tendency to an increased state of activity. "Considerable interest," says the *Wolverhampton Chronicle*, "is felt as to the propable course of the trade. Orders have not come in so freely as was expected, and stocks of pig-iron are increasing. Since the introduction of hot-blast the powers of production have vastly increased, when compared with former years. In 1750 the entire annual production was 75,000 tons; in 1800, 180,000 tons; in 1825, 600,000 tons; and in 1851, 2,500,000 tons: the production of the United Kingdom last year was 3,000,000 tons. The cessation of hostilities has at present left this enormous make without an adequate market. The consequence is that pig-iron has receded in price, and good mining pigs may now be quoted at 4*l.* 10s. per ton. The anticipations of the trade have not been realised as regards foreign orders, from America in particular. There have been none of any account for a considerable period. American dealers, no doubt, are holding off as long as they can, expecting a reduction in price."

Messrs. Fox and Henderson have undertaken the execution of public works in Sweden, which will require a considerable time for their completion.

The copper and brass manufactures continue in some degree disturbed by the recent reduction and present unsettled state of the price of copper. This suspense, according to the *Times*, is felt, however, more by the makers of the smaller descriptions of articles than by the large founders. The copper tubing and wire businesses are said to be brisk, and to be less influenced than could have been expected from so sudden a fall. The order for the brass boiler tubes for the monster steamship now building at Millwall has been given to Messrs. Everitt and Sons, of the Kingston works. The quantity required is from 30 to 40 tons.

Aris's Birmingham Gazette has published some forcible articles on the copper monopoly. The smelters' combination have, it appears, done just as they liked with the prices of copper. They have increased their share—the lion's share—for charges and profits from 9*l.* odds in 1843 to actually no less than 43*l.* in 1856 under the very same pretences! Well may they be able to come down 18*l.* 10s. per ton at a single stroke, as they lately did. Miners and manufacturers have hitherto been equally at their mercy, and the paper alluded to proposes to break up this unconscionable monopoly by means of a new company of smelters, under the Limited Liability Act. Have not the old smelters already had the fear of some such rivalry under the new Act in their eye, when they so unexpectedly and unaccountably reduced the price of copper recently from 126*l.* per ton down to 107*l.* 10s.? The gross amount of the fortunes realized of late years by the smelters, may be roughly guessed from the following statistics given in *Aris's Gazette*:—The total quantity of copper ore raised in Cornwall during the year from June 30, 1855, to June 30, 1856, was 209,305 tons, producing 13,274 tons 15 cwt. of fine copper. The amount of money produced by this quantity of ore was 1,283,639*l.* 8s. 6d.; the average price per ton was 6*l.* 2s. 6d.; the average produce 6⅜; the average standard 140*l.* The result of the Welsh copper produce differs considerably from that of Cornwall. The total quantity of ore raised was 46,481 tons; the quantity of fine copper produced 6,470 tons 11 cwt. the amount of money 698,418*l.* 6s.; the average produce per ton 13⅞; the average price paid to the miners, 15*l.* 0s. 6d.; and the average standard 124*l.* 2s. 6d. The total quantity of copper ore raised in both Wales and Cornwall was 255,785 tons, producing 19,745 tons of fine copper, costing 1,982,057*l.* 14s. 6d." It may be desirable, adds the same authority, to inform persons not conversant with trade terms, that the meaning of the word "standard," so constantly used in connection with copper, is this:—It denotes the estimated value of the fine copper per ton, considered, from the various assays, to be in the ores sold; less a fixed sum per ton, namely 2*l.* 15s. which is deducted for the cost of smelting. [The actual outlay of the smelters, we presume, on which they base their superstructure of "charges."] Since the improvements in obtaining the pure metal from the ores on the large scale are greater than the assays would show, copper is now usually sold under the standard, which fluctuates considerably, and is really, for general purposes, a very fallacious guide to the value of the metal.

PREVENTIVE SYSTEM AGAINST INUNDATIONS IN FRANCE.

In an able and business-like letter to M. Rouher, the French Minister of Public Works, the Emperor treats of the late inundations, and suggests preventive measures to render their future recurrence less likely. No claim to originality is made; the principal sources of the suggestions, on the contrary, being clearly indicated; only the Emperor, in elucidating these principles, with the aid of common sense, shows his determination that what had heretofore only been talked of, and in a fragmentary way, shall now be done, and on a great and effective scale.

The letter thus broaches the subject:—

"Monsieur le Ministre,—After having examined with you the ravages caused by the inundations, my first object of consideration has been to find the means for preventing similar disasters. According to what I saw, there are in the greatest number of the localities secondary works, indicated by the nature of the ground, and which skilful engineers might readily execute. * * * * But as to a general system to be adopted in order to protect for the future, from such terrible scourges, our rich valleys traversed by large rivers, that is still wanting, and must be absolutely and immediately found.

"At the present time every one calls for a dyke, being satisfied with diverting the water from himself and throwing it on his neighbour. The system of dykes is only a palliative, ruinous for the state, and imperfect for the interests to be protected; for, in general, the sand which is brought down constantly elevating the bed of the rivers, and the dykes tending to narrow them, it is necessary to be constantly adding to the height of those dykes, to be prolonging them along both banks, and to subject them to a constant superintendence."

The Emperor then proceeds to point out the cause of such inundations to be chiefly mountain rains.

"Everything, therefore," he continues, "consists in retarding the running off of the water. The means of effecting this is to erect on all the tributary streams of rivers, at the mouths of the valleys, weirs, leaving in the centre only a narrow passage for the waters, and thus keeping them back when their volume increases, and forming reservoirs which could only empty themselves slowly. It is necessary to do on a small scale what nature has done on a large one. If the lake of Constance and the lake of Geneva did not exist, the valley of the Rhine and that of the Rhone would only form two vast sheets of water."

After entering more minutely into the details of the system suggested, the emperor gives orders that it shall be forthwith examined on the spot, with a view to its being carried into effect without loss of time, attention being also drawn to special works requisite at various points along the route of the late inundation, as at Lyons, &c., and a wish expressed that in the promotion of engineers regard shall be had to their previous local experience, so that the state may not lose the advantage of such special knowledge by promotion to or employment in other services in which it would be of little or no avail.

What about the bridges?

RIPLEY'S HOSPITAL, LANCASTER.

The first stone of this new hospital was laid by the Bishop of Manchester, assisted by the Bishop of Chester and a numerous body of clergy.

The late Mr. Thomas Ripley, of Liverpool, had often expressed his desire to bestow some lasting memorial of his regard for Lancaster, and after his decease, his widow, Mrs. Ripley, resolved to devote a considerable share of her means in carrying out the expressed wish of her husband, who appears to have had in view the endowment of an hospital; and it is in pursuance of this resolution that the foundation has now been laid of a new hospital at Lancaster.

The site is about a quarter of a mile from the town. The building is to be in the Early Pointed style.

The plan is somewhat in the form of the Roman capital letter E, *i.e.* with a side and two wings. It fronts the north-west, the centre line of the building being through the centre of John o'Gaunt's Tower in the castle. The side between the wings is 195 feet in length, and is divided into three equal spaces by a bold projection in the centre, which rises to the height of four stories (68 feet). The two side spaces rise to the height of three stories (60 feet). In the centre division of the side is the principal entrance and staircase leading to the committee-room, upper hall, matron's room, and waiting-room; and in the top story is the infirmary, nurse's room, &c. At the back are the kitchen offices, three stories high (45 feet). Over the infirmary, in the middle of the front projection, rises a clock-tower, 18 feet square, and 98 feet high, pierced with three tall lancet lights on each side. At the north-west angle of the tower is an octagonal turret, with spiral stair. The two side spaces and adjoining wings are respectively appropriated—the one to boys and the other to girls—having each their separated play-rooms and grounds. From the centre projection on each side to the wings extend arched or cloistered corridors, communicating with the wings and side divisions by broad stone stairs. The wings on each side are 130 feet long, each four stories high (68 feet), and are terminated at the north-west extremities by houses, one for the schoolmaster on the boys' side, and the other for the schoolmistress on the girls' side. The two wings are each calculated to contain fifty children, making thereby for each division of the building accommodation for 150 boys and 150 girls, or 300 altogether. The material chosen for the exterior of the building is white sandstone from adjacent quarries. The spaces between the hewn parts are to be filled in with inserted rubble. The architect is Mr. J. Cunningham, of Liverpool, and the contractor is Mr. Charles Blades, of Lancaster. The estimated cost is nearly 25,000*l.*

THE VENTILATION OF ALL BUILDINGS.

It is a disgrace to the boasted civilization of our age, that ventilation has not been made imperative on landlords in all rooms, whether inhabited or not. How many human beings have wasted their lives in sickness, to a great extent from inhaling foul and unwholesome air (aided, it is true, by the shopkeeping poisoners and adulterators), we may not be able to learn; but if it could be got at, I believe the numbers would be found to be enormous. Thousands of men, women, and children are compelled by stern necessity to live, eat, and sleep in one apartment—the only means by which they can get fresh air being by the doors or windows: these are both liable to objections, especially in winter time, as too large a volume of cold air is admitted by these means; and in summer it is nearly as bad, especially if the weather be wet or windy. Ventilators made of *iron*, and on the same principle as those used by publicans to carry off the smoke of tobacco, are simple, and would be found, it is believed, efficacious; such as the perforated discs or plates, one sliding over the other, to cover the apertures when deemed necessary. No apartment in any house should be without them. Cellars, also, would be free from mephitic vapours and noisome smells, which often enter the dwellings to which they are attached.

Pure air (or as pure as we can get it in large towns like London, &c.), is as necessary as the light. The sluggishness with which many of us arise from our beds to perform the avocations of life, tell plainly enough the ill effects, in most instances. He among our representatives who shall introduce a Bill into Parliament to make their introduction impera-

tive, and liable to fine if omitted, would deserve and receive the grateful thanks of many a poor artisan who may, with his wife and several children, be the occupants of *one* apartment. I humbly suggest that it would be preferable that they should open into the open air direct, and *not* through the chimney, for obvious reasons, one of which is, that should the smoke be driven down by high winds, the apartment would be filled with smoke if they communicated with the chimney; and if they opened direct into the atmosphere, one perforated plate would probably be sufficient. Two ventilators, one placed above the other, would be better still, the upper one for the egress of the rarefied air, and the lower for the entrance of fresh air. YOUNG ENGINEER.

CONSOLIDATION OF THE PUBLIC OFFICES.

THE following is a summary of the proposals contained in Sir C. E. Trevelyan's evidence relative to the consolidation of the public offices:—

"That a building be erected between the Banqueting-house and the river for the War Department (including the head-quarter offices at the Horse Guards), according to Inigo Jones's designs for Whitehall Palace, or an adaptation of them, having one face towards the Houses of Parliament, another towards Charing-cross, and a third towards the river.

That the Horse Guards and Lady Dover's house be then removed, in order that Whitehall Palace may be opened to St. James's-park, and that St. James's-park may be extended, on either side of Whitehall-Palace, to the Thames.

That the Somerset-house and Whitehall branches of the Admiralty be brought together in a block of buildings to be constructed between the site of the Horse Guards and Charing-cross, in extension of the existing Admiralty, having one face towards the street and another towards the park; and that the houses in Spring-gardens be removed, and an opening made between St. James's-park and Charing-cross.

That the existing line of the public offices be extended from the corner of Downing-street to the corner of Great George-street, forming one side of a spacious square, the other sides of which would be towards the Abbey, the park, and the Admiralty.

That the civil departments of the Government be accommodated in this square, with their dependent offices grouped around them. Thus, the General Pay Office and the superintending establishments of the different branches of the public revenue would be brought into immediate connection with the Treasury; the Chief Secretary for Ireland, the Lord Advocate of Scotland, the Board of Health, the Convict Department, and the Inspectors of Prisons, Mines, and Factories, with the Secretary of State for the Home Department, and so forth.

That the space between the line of civil offices and the river, and between her Majesty's ancient palace of Westminster and Whitehall-palace, be then cleared of buildings.

That Somerset-house, which would he left tenantless by these arrangements, he re-appropriated as may be most for the public advantage. If it should be determined to make provision for the courts of law (including the Court of Chancery, and the Ecclesiastical, Testamentary, and Admiralty jurisdictions), at Somerset-house, it might be done out of the surplus unsued legal deposit funds, and the existing buildings at Somerset-house, would furnish accommodation for the various legal offices, including the registries of wills, judgments, &c.

That, in order to bring the Houses of Parliament and the public offices into immediate connection with the courts and inns of law, and with the City, and to relieve the existing overcrowded thoroughfares, a railway be constructed, according to the most approved arrangements, along the river-bank from Westminster to the City, in connection with the works for purifying and embanking the Thames; and that the most ready means of communication by electric telegraph be established between the courts of law and the inns of law and Houses of Parliament.

That a committee be appointed, consisting of persons carefully selected as best qualified on account of their experience and ability, to advise the First Commissioner of Works and the Government in respect to—

1. The relative situation of the different offices.
2. The order of time in which they should be built, the precedence being given to the War Department and the Foreign Office; and
3. The most convenient interior arrangements for the several offices; and

That the following steps be taken in reference to all the new buildings:—

First. That general specifications of the several buildings be published, and the architects of every country be invited to send in plans and elevations.

Secondly. That when received, these designs be exposed for a sufficient time to public view, and that the selection be made after full discussion and mature deliberation.

Thirdly. That when the plans and elevations have been resolved upon, detailed specifications and working drawings be prepared, in order that the construction of the buildings may be put up to competition in suitable portions; and

Lastly. That everything connected with this undertaking be done upon the sole personal responsibility of the First Commissioner of Works acting under the Executive Government; early and full information relating to every important step being submitted to Parliament."

Notices of Books.

Practical Astronomy, Navigation, Nautical Astrononomy, and Meteorology. By various Authors. Houlston and Stoneman, Paternoster-row; and Orr and Co. Amen-corner. 1856.

THIS really extraordinary five-and-sixpence worth of useful knowledge consists of the several treatises named, which originally appeared in a serial form as part of "Orr's Circle of the Sciences." The authors are Mr. J. R. Young, late professor of mathematics in Belfast College; Mr. Hugh Breen, of the Royal Observatory, Greenwich; Mr. J. Scoffern, M.B.; and Mr. E. J. Lowe, F.R.A.S. of the Highfield House and Beeston Observatories,—all competent men.

The volume is plentifully illustrated, and each treatise is actually worth the price of the whole, were it not that the paper is, perhaps, rather thin; but how can it be otherwise at such a price?

In dipping into the several treatises here and there, the graphic and familiar illustrations of the expansion of iron by heat happen to suggest an idea which it may be worth while to note here, though with no critical view as regards the book itself. Various attempts are being made to "supersede steam" by means of still rarer or more expansive vapours, such as ether, chloroform, &c. as well as by other forces, such as the hydraulic. Did it ever occur to any one to try the other end of the scale of physical substance, and in place of vapours, gases, or fluids, to consider what might be done with solids as a source of power, at least applicable to some purpose or other? Iron, when heated, expands both in length and thickness, and in cooling again, contracts and shortens with a force of immense and irresistible intensity. Could not this force be put into the harness of machinery, and by the aid of levers, great wheels and small ones, cranks and spindles, be compelled to work for humanity? It is easy to see that there are some difficulties in the way of making such a force available, but cannot these difficulties be overcome by some ingenious device or other? This is to be noted, that the *modus operandi* of such a force is, more than any other, analagous to the operation of that animal power—that muscular force of contraction—with which the great Author of all endows the living machinery or mechanism of his own wondrous works. It is even now believed by physiologists that the exercise of the muscular force consists simply in the cutting off from the muscle of that nervous stimulus (or rather we should say of that nervous expansive force, analogous to heat itself) which keeps the muscle relaxed, leaving a mere physical contractile force to operate in its absence, through an internal organism beautifully adapted for facility of action, and hence to contract the muscle, and move the levers of the limbs to practical purposes. The restoration of great walls to the perpendicular is not the only *purpose* to which the contractile force of cooling iron might be put.

VARIORUM.

A SHILLING PAMPHLET "On the Introduction and Progress of the Screw Propeller, with Statistics of the Comparative Economy of Screw Ships and Paddle Vessels for Her Majesty's Service," &c. has been published by Messrs. Longman and Co. It consists mainly of a reprint of various forcible articles on the title of Mr. Smith to be regarded as the introducer of the screw,—a title which, as we have before said, cannot well be disputed. The question of its invention is one which cannot be so easily settled. We have shown that even Watt, though he suggested its adoption in ships, was not the originator of such an adaptation, the Chinese having from time immemorial applied the screw to the propulsion of vessels. Of course, facts such as these do not in the least diminish the merit of the Middlesex farmer as the introducer of the screw into the navigation of European and American nations. It was only by the utmost pertinacity and exertion that Mr. Smith succeeded, and no man we know of can lay claim to a prior and successful exercise of such endeavours. The Government have recognised Mr. Smith's claim in rather a shabby way by according him a pension of 200*l.* a year; but it is to be hoped this is not all he will eventually gain by the sacrifices and the exertions he has made for the service of his fellow-men. ——Wilson, of the Royal Exchange, London, has issued a sort of blue book, titled the "Principles of Railway Construction analyzed in reference to their Financial Effects on Shareholders, and on British and Indian Interests." It is, in fact, a report by Lieutenant-Colonel J. P. Kennedy, as engineer in chief and managing director of the Bombay, Baroda, and Central India Railway Company, to his constituents, on the principles and procedure which ought to be adopted (as well as on those which have been adopted), in reference to the introduction of railways into India; and it contains a great deal of valuable and useful matter. "The object, from first to last, of this paper," says the author, "is not to impugn rights, or criticise measures, but to investigate principles at the outset of a most extensive expenditure, with a view to avoid in India those grievous failures that have so generally characterized a like expenditure in England." One chief modification of ordinary principles in the introduction of railways into India, he urges, should be that the remuneration of directors and professional advisers or executive officers ought in part to be dependent on the success of their operations. The absence of this principle in England goes far, he thinks, to account for the numerous failures that have occurred. The reporter, we may add, contemplates an extensive use of iron instead of wood, as for sleepers, viaducts, &c. and he estimates the probable cost of the new lines at 4,369*l.* to 6,000*l.* only a mile.——A small volume on "The Language of Specifications of Letters Patent for Inventions," with authorities and decisions in recent cases of importance, by Mr. John Macgregor, of the Inner Temple, barrister-at-law, has been published by Benning and Co. of 43, Fleet-street, law booksellers. No inventor or intending patentee should be without such a work as this while considering how he ought to describe his invention, so as safely to steer through all the subtleties and quibbles of the law in preparing his specifications of patent. No patent agent can be a sufficient substitute for such a work to an inventor, for it is impossible that any patent agent can have the substance of what is here presented, condensed and pithy though it be, at his tongue tip or fingers' end, so as to guard his client against every flaw in those descriptions, qualifications, claims, and disclaimers which the inventor must first of all provide his agent with: a conscientious agent, indeed, would rather, we should think, advise his client to study well just such a work as that under notice before he submitted his invention to him either verbally or in writing.

Miscellanea.

ST. LEONARD'S, SHOREDITCH.—The interior of St. Leonard's Church, Shoreditch, has been restored, under the superintendence of Mr. Kneightly: the painting and decorative works were executed by Mr. Kuckuch, and are just completed. The church was re-opened for divine service on the 20th ult.

OUR GRAVEYARDS.—In the *Builder* of July 26, you have an engraving of the stowing away of gravestones at Golden-lane Burying-ground. You might have had a sketch some days ago of a similar stowage away at Tottenham-court-road Burying-ground, but now it is too late, for a few nights since, after dark, the stowage was cleared out, and the stones carried off, to where?—and echo asks where? Such shameful deeds ought to receive a world-wide exposure.

AN INHABITANT OF MARYLEBONE.

Australian Workmen.—The workmen employed on the Sydney Railway have just presented the contractor, Mr. W. Randle, with a vase of pure Australian gold (20 carats), weighing 80 ounces, as a testimonial of their esteem for him as an employer. This magnificent present cost the workmen 700 guineas. It is 17½ inches high.

The Warm-water Apparatus by which England is warmed.—A review compares the way in which the north-western parts of Europe are warmed by the Gulf stream to the method of warming buildings by hot-water, and calls the Torrid Zone the furnace, the Caribbean Sea and the Gulf of Mexico the boilers, the Gulf stream the conducting pipe, the great hot-air chamber being from the banks of Newfoundland to the shores of Europe, whence the heat is taken up by the prevailing west winds. Owing to the influence of the Gulf stream, Ireland is clothed in robes of evergreen grass; while, on the American shore, in the same latitude, is the frost-bound coast of Labrador. The port of Liverpool has never been closed with ice in the severest winter. The Laplander cultivates barley in a latitude which, in every other part of the world, is doomed to sterility. Were the Isthmus of Panama broken through by some convulsion of nature, and the Gulf of Mexico no longer a gulf, the equatorial current of the Atlantic passing through into the Pacific instead of being reflected back to England, Britain, as the writer remarks, might then become a Labrador, and would cease to be the seat of a numerous and powerful people.

Manchester Exhibition of Art Treasures.—In a circular recently issued by the Executive Committee, they say,—"Our design is to exhibit in one building not only examples of the chief works of all the great masters of painting and sculpture, both of the ancient and modern schools, but specimens of artistic excellence or of antiquarian interest, illustrative of the past and present state of art in every quarter of the world; and we contemplate the compilation of a catalogue which will leave a permanent record, useful alike to the artist and to the patron of art, and interesting to every observer of the intellectual progress and refinement of nations." And they make a strong appeal to all who can assist them in their object. The committee would find an advantage in connecting with their undertaking the names of some few men known to have a knowledge of art.

Metropolis Act Amendment Bill.—This Bill, as sent down from the House of Lords to the Commons, provides, by clause 1, That in parishes where church rates were made in any open vestry, or in any meeting in the nature of an open vestry, such power shall be exercised in the same manner as before the passing of the Act of 1855. Clause 2 provides that nothing in this Act, or in the Act of 1855, shall affect vestries created for ecclesiastical purposes only. Clause 3. Other duties performed by vestries shall be performed by the new vestries, created under the Act of last session. The election of such vestries remains untouched, and remains the same as provided by Hobhouse's Act, and the Act of 1855. Clauses 4, 5, and 6, provide that compound householders may vote. Clause 7. The payment of parochial rates as a qualification for voting, shall not be taken to include church rates. Clause 8 provides that the qualification of vestryman shall be determined by "the rateable value" of his premises, and not by "the gross estimated rental." Clause 9 regulates the calling of meetings of vestries, and simplifies the mode of so doing. Clause 10 enables the Metropolitan Board of Works to make application to parliament for the purpose of providing places of recreation for the public, and removes doubts as to the power of purchasing such places as Hampstead Heath, &c. Clause 11 enables district boards and vestries to take land by gift or agreement. Clause 12. The Act of last session and the Act of this session shall be construed as one Act.

Edinburgh.—Extensive alterations in connection with the Advocates' Library at the Parliament-house, Edinburgh, have been for some time in contemplation, and have just been approved by the faculty of advocates or barristers. The plans were originally prepared by Mr. Playfair, and have been adapted to existing circumstances by Mr. Matheson, of Her Majesty's Works: operations for carrying them out are to be immediately commenced. These alterations and additions consist mainly in extending the corridor library by the removal of the wooden enclosures at its eastern end, and in the removal and reconstruction of the law library adjoining. The corridor will thus be lengthened to about one hundred and twenty feet, and extend to the great hall of the Parliament-house, from which it will have a direct and suitable entrance. The law library will be entirely reconstructed, partly on its present site, and partly on that of the lock-up house, which is about to be removed. The library will be about fifty feet long and forty in breadth, and will be lighted by large oriel windows, and from the roof.

Society of Arts.—Election of Assistant Secretary.—There were 100 candidates for the office of assistant secretary. To reduce this number the council appointed a committee (on which no examiner was placed) to investigate the antecedents and claims of the various candidates. This committee reported the names of 16 gentlemen as fitting candidates for the office. The candidates were examined by a committee of examiners, chiefly professors from King's College, who returned the names of the five following gentlemen as having acquitted themselves the best in the trial:—Edward Holmes, Charles Critchett, equal; M. H. Wilkin, Dr. Henry, J. P. Bidlake. The council have elected Mr. Critchett to the office.

North Oxfordshire Archæological Society.—A meeting of this Society was held at the Mechanics' Institute on Tuesday in last week. Although during the last twelve months the Society has been in abeyance, and consequently inoperative, excepting getting out the volume of Transactions, which has just been issued, it was resolved, that the excursion should take place in the week beginning on the 20th of August, if the secretaries find that arrangements to that effect can be made.

Exeter Diocesan Architectural Society.—A meeting of the Plymouth Committee of this Society was held last week, the Rev. W. J. Coppard in the chair. A paper, by Mr. Charles Spence, on the ancient chapel of St. Nicholas, on Rame Head, was read. The next excursion meeting of the society was fixed for Tuesday, 29th July, when many members of the society from Exeter were expected to join the local committee in visiting the new churches at Devonport, the Keyham Docks, Buckland Monachorum church and abbey.

The Salford Baths and Washhouses.—The baths and laundries at Salford are far advanced towards completion. They are situated in Collier-street, Greengate, Salford, and are erected by the "Manchester and Salford Baths and Laundries Company," incorporated in 1855. The building is of brick and stone. The architect is Mr. Thomas Worthington, of Manchester; and the contractor, Councillor Neill, of Strangeways. The façade of the building, which is in Collier-street, presents a length of frontage of about 140 feet, and is two stories high, the centre rising an additional story. The style is Italian. The building was commenced in November, and is expected to be publicly opened in August.

The Russian Carpenters.—Baron Von Haxthausen, in his "Russian Empire," thus speaks of the rude skill of the Russian carpenters:—"The correctness of eye, the ease, dexterity, and rapidity with which they detect and turn to account every advantage, is wonderful with these people, or rather with the whole Russian nation. The genuine Russian plotuik properly carries no other implement than an axe and a chisel. With the axe in his belt, he traverses the empire from one end to the other, and seeks and finds employment. It is incredible what he can do with his axe: all the manifold instruments of our accomplished artisans are quite unknown to him; and still his work is not inferior, nay, is often better adapted to the purpose, than that of our more highly-educated workmen. It is often difficult to believe that such charming decorations and carvings as are found on Russian ships and houses can have been produced with a clumsy axe and mere common chisel. The genuine plotuik in the interior despises even the use of the saw, which, however, the workman in Moscow knows well how to use. In the north, where wood is still in superfluity, he hews down a whole tree when he wants a plank, and cuts away at both sides of it, until only the part which he wants remains."

Drainage of Sunderland.—An extensive system of sewerage is about to be carried out in this town according to the plans, and under the direction of Mr. William Crozier, C.E. the borough engineer. It comprises eight miles of brick sewers, with stoneware invert blocks, and forty-six miles of pipes, excluclusive of all house drains. The contracts were considered a fortnight ago, and the tender of Messrs. H. Doulton and Co. of London, for their glazed stoneware-pipes, was accepted. This, we believe, is the largest contract for pipe-drainage which has yet been let, and the tenders were from all parts of the country, the samples amounting to about 300 pipes: these were submitted to various tests to show their absorption when whole, and when broken, and also the internal pressure they would bear. The maximum pressure sustained by the pipes selected, Mr. Crozier found to be 160 lbs. to the square inch; and the absorption of these pipes, when broken, was not quite 1 per cent.; while some of the samples submitted absorbed 10 per cent. and the broken pipes in some instances double the quantity they did when whole. The trials were made by Mr. Crozier, at the Sunderland Water Works, where there is a fine machine for testing.

The Chester Surveyorship.—Mr. G. A. Bell, the Chester City Surveyor, has tendered his resignation, it appears, on account of certain meddling and vexatious practices adopted by individual members of the Improvement Committee of the City Council.

Jerusalem and Egypt.—It is to be hoped that some enterprising publisher may lead Mr. Seddon to continue his Illustrations of the Holy Land with a view to publication. The drawings he has already made, and which have been exhibited to many persons in London, convey a more correct idea of the country than anything that has yet been done, and show the admirable spirit that animates the artist. His principal view of the country round Jerusalem is a monument of patient perseverance tributary to skill.

Shakspeare's House, at Stratford-on-Avon.—A gift of 500*l.* by Mr. John Shakspeare, of Langley Priory, near Ashby-de-la-Zouch, has now been made over to trustees, for the purchase of certain property on each side of Shakspeare's house, and the restoration of the Swan and Maidenhead to its original state. It is intended to remove whatever does not form an integral part of "the house" property on the White Lion side, and also Mr. Gill's house in the opposite direction. Mr. Shakspeare also, it is said, contemplates some farther donation in aid of the proposed improvements and restorations.

TENDERS

For building three houses in the Denbigh-road, Kensington, for Mr. W. Ford; Mr. W. Pocock, architect. Quantities supplied:—

Hunt and Gill	£3,298	0	0
E. O. Symons	3,045	0	0
Higgs	2,828	0	0
J. and C. W. Todd	2,749	0	0
George Todd, jun.	2,587	0	0
Smith	2,496	0	0
Adamson and Sons	2,460	0	0
Cowland	2,415	0	0
S. S. Wilson	2,294	0	0

For the erection of six houses, Anderson's-buildings, City-road; Messrs. Wehnert and Ashdown, architects. Quantities furnished by Messrs. Balam and Lee:—

T. D. Carter	£4,554	0	0
W. Pritchard and Co.	4,200	0	0
Stevenson	3,999	0	0
J. Harmer	3,994	0	0
John Jay	3,980	0	0
Pollock and McLennan	3,957	0	0
Wm. Higgs	3,838	0	0
Day and Co.	3,800	0	0
Wm. Smith	3,643	0	0
G. L. S. Williams	3,512	0	0
G. Nagle	3,500	0	0
Humphreys	3,464	0	0
Keast and Moon	3,363	0	0
Purkiss	3,295	0	0
G. F. Smith	3,131	0	0
Hocken	2,900	0	0
Fraser and Kelly	2,869	0	0
Hall and Son	2,760	0	0
T. B. Cooper	2,534	0	0
J. Ashton (Holloway)	2,396	0	0

For New Prison for Females for the county of Kent; Messrs. Whichcord and Son, architects:—

Bricklayer and Mason's work—			
W. Cobb	£4,698	0	0
G. Chambers	4,662	0	0
J. Goodwin	4,560	0	0
Thos. Thompson	4,489	0	0
Sutton and Walter (accepted)	4,104	0	0
Smith and Founder—			
Handyside	866	0	0
Drury and Biggleston	710	0	0
Weeks and Petman (accepted)	695	0	0
Plumber, Glazier, and Painter—			
Sutton and Walter	436	0	0
Chambers	423	0	0
Court	417	0	0
Ashdown	399	0	0
Hyles	388	0	0
Foord (accepted)	375	0	0

For building new schools and dormitories, new hospital, &c. at the Guildford Union Workhouse; Mr. C. H. Howell, architect. Quantities supplied by Mr. Poland:—

Daly	£8,844	0	0
Carlisle	7,468	11	9
Mills and Son	7,290	15	2
Jas. Ive and Son	7,200	0	0
Moon and Son (Guildford)	6,890	0	0
W. and T. Smith	6,876	17	0
Hopkins and Roberts	6,800	0	0
Moon and Son (Godalming)	6,640	0	0
Pollard	6,550	0	0
Nye	6,497	0	0
Woodruff	6,460	0	0
Henry John Ive	6,450	10	0
James Smith	6,302	0	0
O. S. Ellis (accepted)	5,947	0	0

TO CORRESPONDENTS.

"*Gilding on Glass*"—A constant reader says: "Having a number of letters to be gilded on glass, what process is required for preparing the glass to receive the gold, so as to prevent its coming off in course of time?"

"L. J."—"H. C."—"S. B. H."—"A Young Observer" (the locality is excellent, the position a bad one)—"S. H."—"Young Engineer."—"W. T."—"G. G. S."—"C. McK."—"J. M." (we cannot refer)—"H. O. M." (we are not disposed to return to the subject)—"C. K."—"J. M. T."—"J. McC."—"J. C."—"Tallesin."—"W. E."—"Mr. H."—"Mr. W."—"C." (all right)—"S. S."—"J. W."—"L."—"J. R."—"W. J. C."—"M. W."—"F. G."—"J. A."—"S. B. H."—"Goth"—"A Working Man."